The IRON AGE

October 17, 1957 A Chilton Publication The National Metalworking Weekly

Special Survey Report

How to Plan Your New Product P. 85

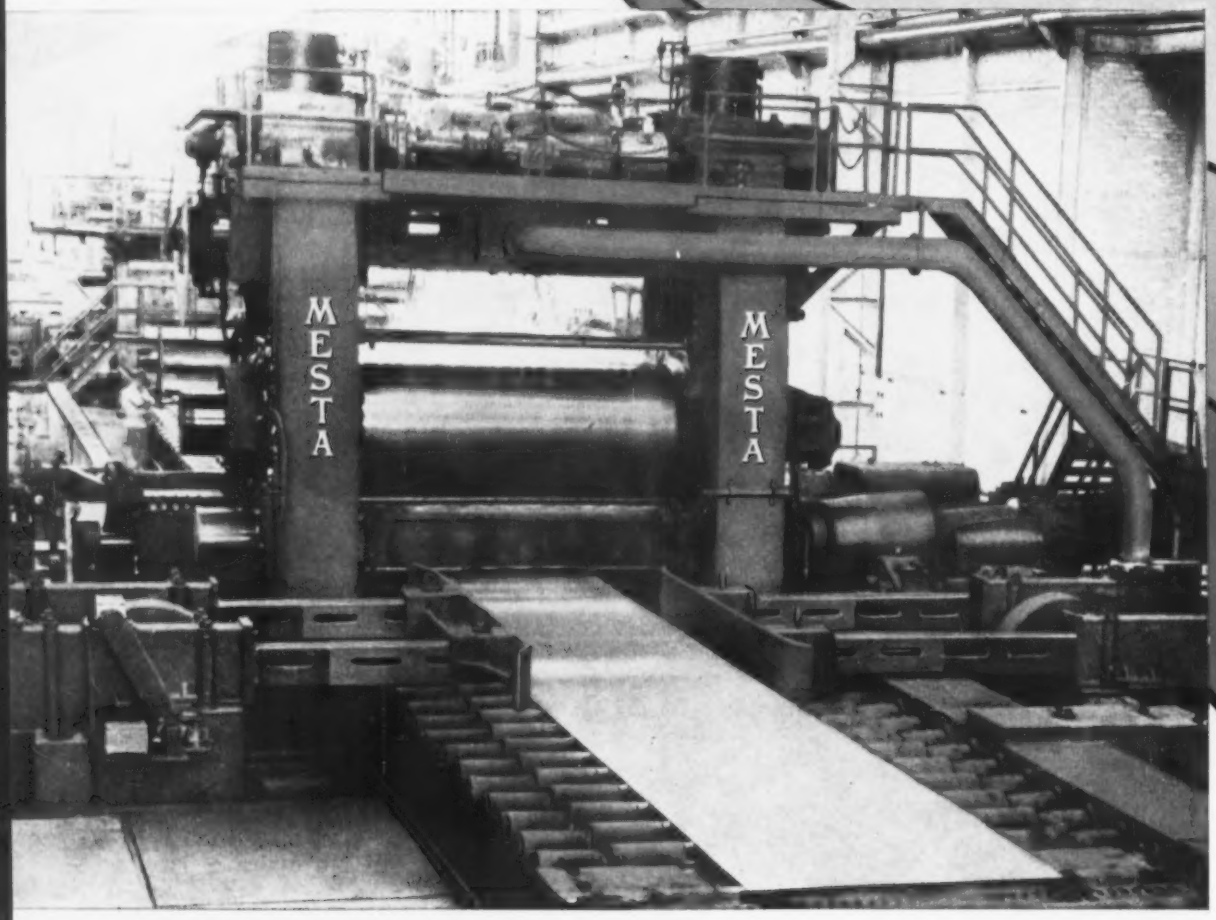
Metalworking Fights Skilled Worker Crisis – P. 71

More Jobs For Radioisotopes – P. 111

Digest of the Week P. 2-3

PLATE MILLS

Designed and Built by MESTA



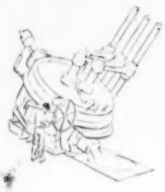
MESTA 132" FOUR-HIGH REVERSING PLATE MILL

MESTA
THERE IS NONE BETTER

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

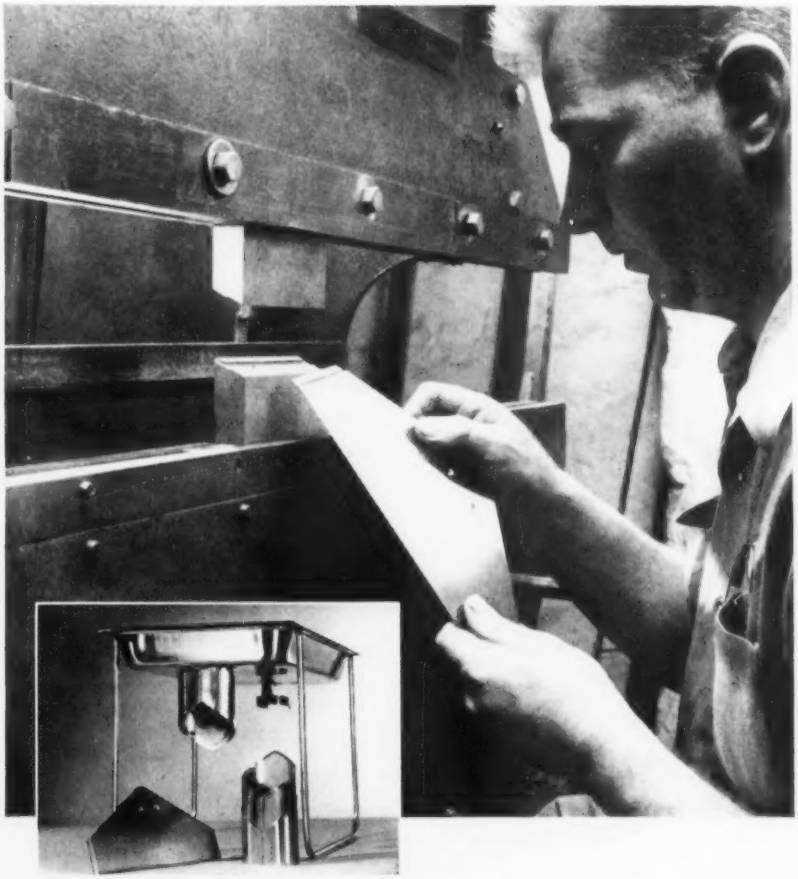


Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



Brake Die saves shop time in forming overlap for steel spout

The problem sounded simple enough — putting an overlap in a section of 20-gage stainless steel, which was then formed into a spout for use in meat-packaging tables. But getting a tool steel which could do the job more economically than the grade formerly used was somewhat of a challenge for the manufacturer, J. B. Dove & Sons, Inc., Philadelphia.

The answer was Bethlehem Brake Die, supplied by our local tool steel distributor, Hill-Chase & Co. Because of Brake Die's easy machinability and good wear-resistance, the new die minimized manufacturing costs. It also helped in producing a better-looking product. Said one of the Dove engineers: "We like Brake Die. It's doing a good job for us."

Brake Die, a special alloy steel, is oil-quenched and tempered to develop a fine balance of mechanical properties. It's ideal where wear-resistance, toughness, resistance to impact and good machinability are required.

Typical Analysis

Carbon 0.50	Manganese 0.90
Chromium 1.00	Molybdenum 0.20

Chances are there might be one or more applications in your shop right now where Brake Die steel could be used to good advantage. Why not talk it over with your Bethlehem tool steel distributor?

BETHLEHEM TOOL STEEL ENGINEER SAYS:

How to Shrink-Fit Tool Inserts

Shrink-fitting of tool steel inserts is a procedure which is being widely used to improve the service life of tools. Shrink-fitting is most applicable to rings and cylinders, such as are used in heading and drawing operations where the tools can be shrink-fitted into large retaining rings. The shrink-fit sets up radial compressive stress in the tool, which is available to oppose radial tensile stress set up in service, and thereby improves the performance as compared to solid tools which are not pre-stressed. Shrink-fitting of tools should be carried out as follows:

1. The retainer must be of adequate diameter and strength to provide the stresses required on the tool insert. This generally means that an alloy steel capable of hardening to approximately 300-400 BHN must be used. Shock-resisting tool steels heat treated to approximately Rockwell C 48 to 52 are used on heavy duty applications. It is recommended that the OD of the retainer be a minimum of twice the ID (preferably three times the ID).

2. A shrink-fit allowance of .003/.004 in. per in. should be provided for. This means that the OD of the insert is .003/.004 in. per in. larger than the ID of the retainer into which it must fit. These dimensions must be carefully maintained in order to obtain the benefits of shrink-fitting.

3. The OD of the insert and the ID of the retainer should have a smooth finish, preferably produced by grinding.

4. The retainer should be heated to a temperature sufficient to cause the expansion necessary to assemble the insert. Care should be exercised not to exceed the tempering temperature used in heat-treating the retainer. If necessary, the insert may be sub-zero cooled to aid in providing the clearance required for assembly.

5. After assembly of the parts, cooling of the assembly should be rapid enough to prevent over-tempering of the insert by heat transferred from the retainer.

THE IRON AGE
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The IRON AGE

October 17, 1957—Vol. 180, No. 16

Digest of the Week in

*Starred items are digested at right.

EDITORIAL

Delayed Payment: Uncle Sam Is Delinquent 7

NEWS OF INDUSTRY

*Special Report: There's No Easy Way Out of Skilled Labor Shortage 71
*What's Wrong With Our Missiles? 74
*Heat Blocks Way to Faster Aircraft 75
*Industry Looks at Thermal Image 76
The Iron Age Salutes 81
*Survey Report: How to Plan New Products 85
Men in Metalworking 107

NEWS ANALYSIS

Newsfront 69
Report to Management 83
*Automotive 94
*Washington 99
*West Coast - 101
*Machine Tools 103

FEATURE ARTICLES

*Radioisotopes: Use Them on Tough Problems 111
*New Spiral Point Twist Drill 115
*Stainless Cars Stand Long Service 118
*Speed Alloy Analysis by X-Ray 120
*Cold Reduction Saves Time, Money 122

MARKETS & PRICES

*The Iron Age Summary 147
*Purchasing 148
Steel Products Markets 150
Iron and Steel Scrap Markets 152
Nonferrous Markets 156
Steel Prices 159
Clearing House 166

REGULAR DEPARTMENTS

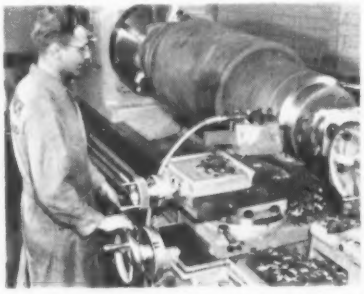
Fatigue Cracks 11
Exhibits, Meetings 13
Technical Briefs 123
New Equipment 134
Free Literature 138

INDEX TO ADVERTISERS 173

NEWS ARTICLES

SKILLED LABOR

Beating the Shortage—Demand for increased productivity means no early end of the skilled labor



shortage. Here's an evaluation of the situation, plus examples of how specific groups are solving their problems. P. 71

MISSILE PROGRAM

What's Wrong? — Is internal rivalry holding back our missile development program? Now that Russia has successfully launched her satellite, public demand for economy is drowned out by cries for speedy action. P. 74

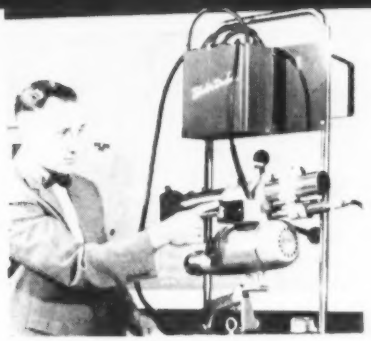
FASTER AIRCRAFT

Heat Is a Barrier — Engineers are making slow but steady progress toward a 2600 mph airplane. The primary problem: Finding a material capable of holding up at 1850°F. P. 75

THERMAL CAMERA

Heat Picture — Thermal image camera opens up new field in metal-

Metalworking



PRODUCT PLANNING: Development of new products is a complex job. Even the best firms have more misses than hits. This special survey report, based on hundreds of firms, points out significant guideposts for management in planning new products. P. 85

working. It records degree of heat through infra-red emissions. Wide use indicated in quality control, flaw detections. P. 76

CONGRESS

No Handouts—Government agencies are warned not to expect supplemental appropriations to restore items cut in the budget. Rep. Cannon talks tough, apparently means what he says. P. 99

FEATURE ARTICLES

RADIOISOTOPES

For Tough Problems — The metals industry has become one of the largest users of isotope gages and tracer techniques. Applications range from basic metallurgical research to practical production areas, such as the continuous non-contact gaging of rolled sheet and strip. P. 111

TWIST DRILL FASTER

With New Spiral Point — Not only is drilling faster, but the self-centering action of the spiral point improves accuracy of hole. The S-shaped cutting edge gets free cutting action near axis, as contrasted with poor cutting action of conventional chisel edge. P. 115

STAINLESS CARS

Stand Long Service—After 20 years of coal hauling service, two hopper cars show negligible corrosion damage. Knowing that the stainless surface will serve through years without maintenance, the designer can specify light gage without needing the traditional allowance for corrosion wastage. P. 118

SPEED ALLOY ANALYSIS

By X-ray Method — Metal analysis with X-ray spectrograph is inexpensive and fast. A metalworking firm uses the non-destructive technique on 29 different alloy grades and finds great savings over wet chemistry methods. P. 120

COLD REDUCTION

Saves Time, Cuts Waste — A blank formed by cold reduction can cut down on the amount of material and machining time needed to finish a shaft. The benefits come in large scale production. P. 122

MARKETS & PRICES

AMERICAN MOTORS

Year of Decision—It will be sink or swim for AMC in 1958. The company is going all out to sell 180,000 cars—3 pct of the market. Romney is confident his company will pull out of the red. P. 94

AIRCRAFT FUTURE

Engineers Take a Look — At SAE meeting on West Coast, engineers discussed trends in plane-making. Steel and titanium are seen taking lead as airframe-structure materials. P. 101

U. S. TOOL RENTALS

ODM Clamps Down—A flock of rigid leasing-practice standards has been issued by Gordon Gray. New arrangement is expected to nip criticism that large companies get most benefit from tool leasing program. P. 103

STEEL INVENTORIES

How About Steel Stocks?—Have steel users cut their steel inventories? Yes and no, say industry sources. P. 147

TRENDS IN SCALES

They're Getting Versatile — Today's weighing devices are often complete packaged systems fitting right into processing or inspection lines. Buyers in current market will find deliveries good, prices not likely to rise. P. 148

NEXT WEEK

METAL SHOW ISSUE

Special Features—Practical solutions to every day heat treating problems are outlined in next week's feature, "How to Get More For Your Heat Treating Dollar." Added to this is a new guide to tempering steels.

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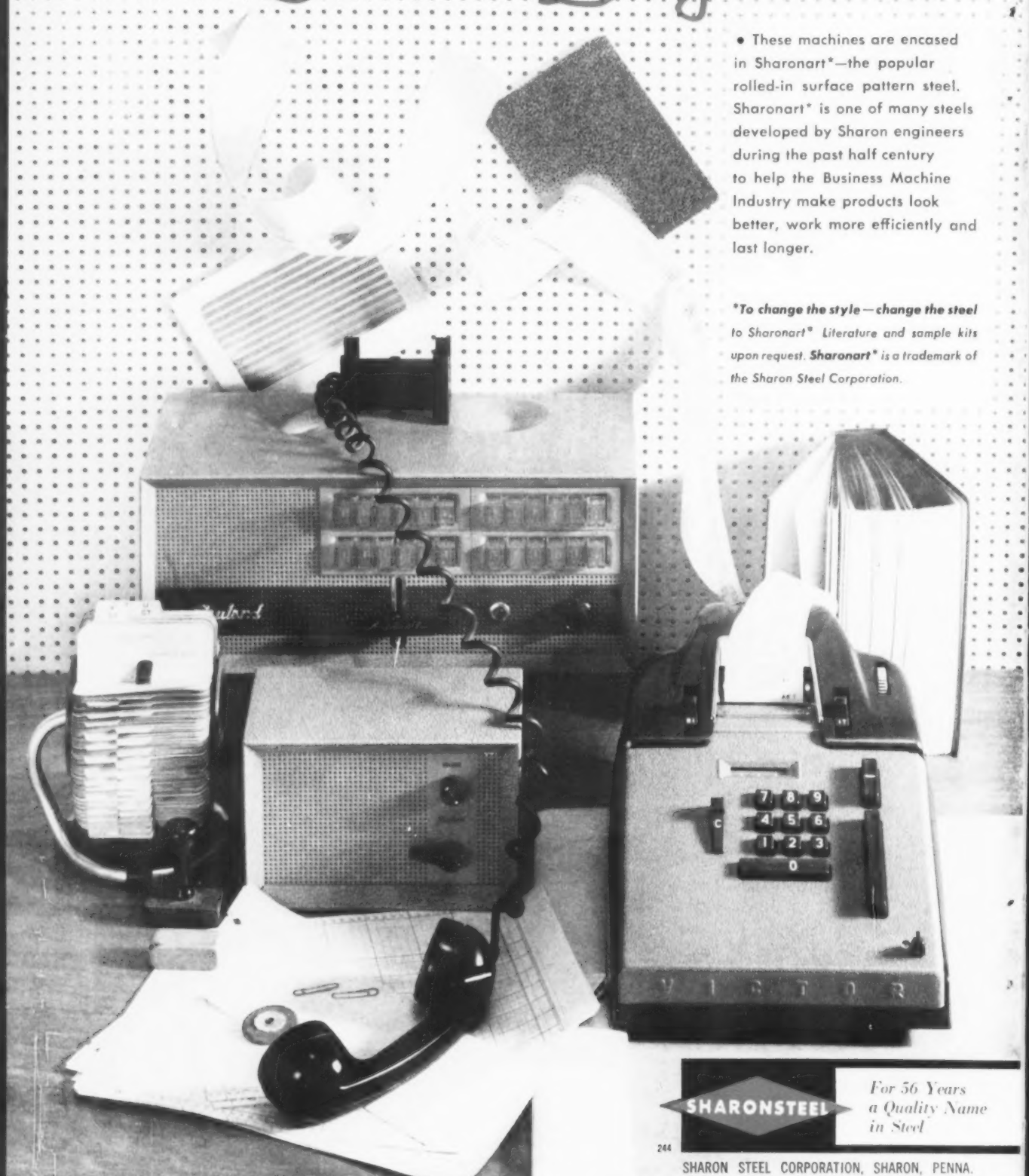

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Delayed Payments: Uncle Sam Is Delinquent

Suppose you promised to pay your department store so much a month and then welshed on the deal. What do you think the store would do? They might give you more time. But for sure they would want to know what gives; whether or not they could expect better treatment.

Suppose that you bought a car and you didn't keep up the payments. You would get a reminder. If you were a good credit risk you might get an extension. But again, they might take the car from you, sell it and get a judgment for the balance. Then you would be in hot water.

We have still another query: Let's say you ordered an intricate piece of equipment. Say it took a lot of engineering, careful planning and required sub-contractors. For some reason or another, suppose you did not have the installments you promised to pay on this obligation.

So you decided to go to the company which took you at your word and went ahead with the project. You told them you couldn't pay what and when you promised. What do you think they would think?

Well, your Uncle Sam is in that spot now. He—through the Air Force—is going to aircraft companies and telling them he can't pay what he promised to pay. And, what's more, Uncle Sam is telling these companies that he doesn't know when he can pay what he promised.

It is said that this shenanigan does not involve missiles. That may or may not be. If the aircraft companies have to bail the government out of its inability to keep within its budget, it will affect missiles too.

But the rub is that the aircraft companies can't do what the stores would do, what a finance company would do. They can't close down on Uncle Sam for a variety of reasons.

First they don't want to. They can't very well tell their government to go pound salt. Especially when we are trying to keep up with the Reds. Nor can aircraft—or other companies—tell Uncle Sam, "Okay, you won't get your product."

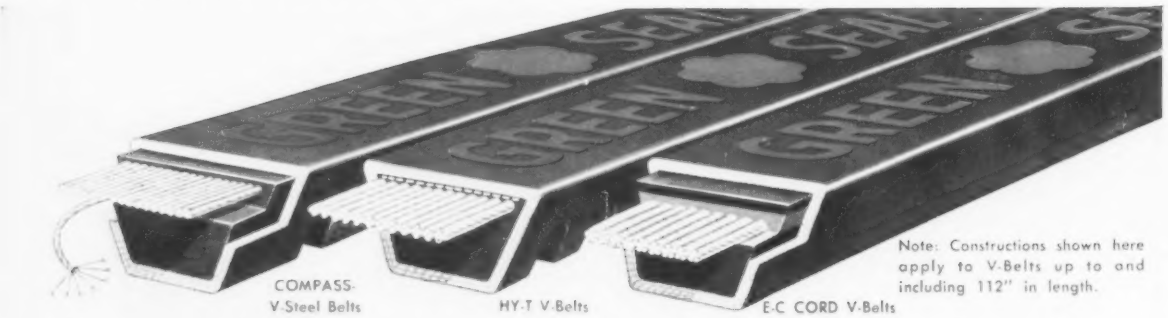
What happens is that aircraft and other companies are being forced to carry the government when they are so short of cash themselves it hurts. What kind of economy is this?

If we are seeking economy let's do it right. Let's not call it "economizing" when our government uses tricky gimmicks, welshes on its obligations and keeps a straight face while it is throwing its weight around.

Tom Campbell

Editor-in-Chief

What's different about



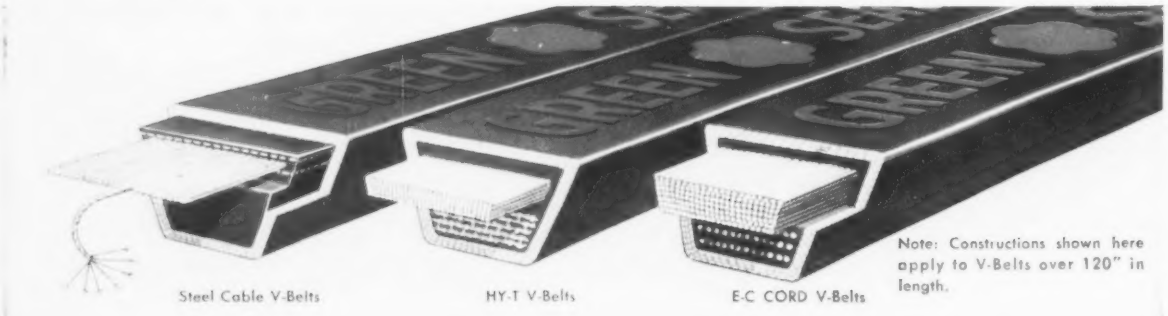
COMPASS V-Steel Belts

HY-T V-Belts

E-C CORD V-Belts

Note: Constructions shown here apply to V-Belts up to and including 112" in length.

V-Belts with the Green Seal?



Steel Cable V-Belts

HY-T V-Belts

E-C CORD V-Belts

Note: Constructions shown here apply to V-Belts over 120" in length.

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No Alibi

Sir—May I have permission to publish in my monthly, "AD LIBB'S," the article that Tom Campbell I know will write either this week or next. This article will be about the Russian satellite is my guess.

Set Alarm—The boys in Washington, particularly, need a bit of probing and I can think of no one but Tom Campbell that can, through your editorial pages, at least set the alarm clock so that we will awaken in time.—R. S. Wahatalo, Libb Tool Co., Collinsville, Conn.

▪ Permission granted. See Oct. 10 editorial, "Alibis Are No Excuse: We Are Losing the Cold War."—Ed.

Pull Up Your Socks

Sir—I have just finished reading the Oct. 3, 1957 issue of The IRON AGE and particularly enjoyed the editorial, "Pull Up Your Socks: It May Get a Little Sloppy," written by Tom Campbell.

I would like to pass this article along to my sales force and would, therefore, appreciate it if you would send me 12 copies of the aforementioned editorial.—H. C. Swain, District Mgr., United States Steel Supply, Div. of U. S. Steel Corp., Houston, Texas.

Sir—We very much like your editorial of October 3rd, "Pull Up Your Socks" . . . We would like 75 copies.—M. K. Brown, Gen. Mgr. of Sales, Penn Metal Co., Inc., Boston, Mass.

Sir—Please send us 40 reprints of Tom Campbell's "Pull Up Your Socks" . . .—A. P. Barton, Pres., The Mutual Mfg. & Supply Co., Cincinnati, O.

Sir—We were very much impressed with your "Pull Up Your Socks" . . . May we have 100 reprints of this excellent editorial?—W. B. Williams, Dir. of Organization & Development, The Kaydon Engineering Corp., Muskegon, Mich.

▪ Because of the many requests, we are making a limited number of reprints of this editorial available to readers.—Ed.

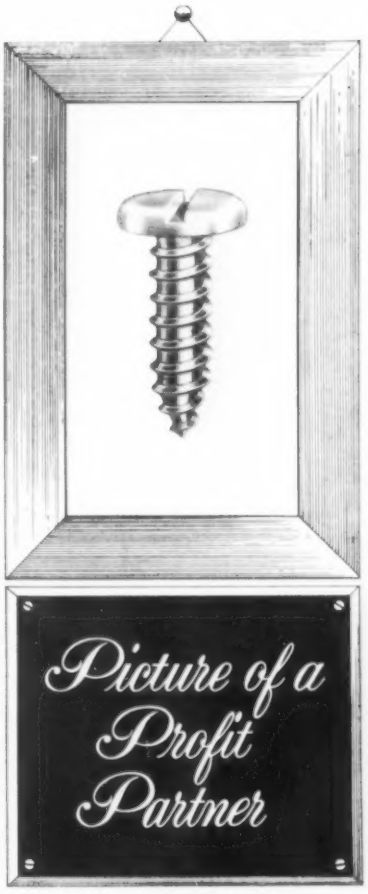
Missile Question

Sir—In the Sept. 19 issue I read in your West Coast column about the effect missiles will have on the electronics industry. We are not in the instrumentation field, however, are quite interested in the launching aspect of missiles.

Wants List—At the recent Western Electronics Show your article states that 629 companies registered from all over the country. I am wondering if you have the registration list for the show or perhaps the registration list for the three chief instrumentation areas on the West Coast.—T. J. Andrews, Marketing Research Mgr., Denison Engineering Div., American Brake Shoe Co., Columbus, O.

▪ Write to R. L. Paulis, Mgr., West Coast Electronic Mfrs. Assn., 342 N. La Brea Ave., Los Angeles 36, Calif.—Ed.

"Great Scott, Penworthy . . . you're corroding."



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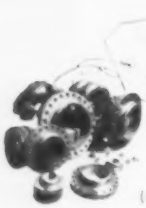

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Confidence

Milwaukee baseball fans are walking on clouds these days. After their ball club clinched the World Series title October 10 you can hardly blame them.

But lest you think their confidence wavered at any time before the "mighty" Yankees we refer you to a letter our Advertising Dept. received from Milwaukee's Bert S. Gittins agency dated October 1. At the top of the firm's letterhead was typed "Baseball Capital of the World."

Business Risk

Throughout history, the real secret of business success has been simply to be in the right business at the right time.

We all know managers who are scrimping along with a paper-thin profit margin, while in the plant across the street a group of company executives, who may not seem nearly as impressive, are doing twice as well.

What Makes Success—The answer, most of the time, lies in the companies' products. For products are the business. Their health, in terms of growing demand, largely determines the success of the business.

So there's little wonder that the metalworking industry, faced with growing competition, is placing more and more emphasis on new product development.

No Easy Job—At a meeting of the American Society of Mechanical Engineers, earlier this year, machine tool manufacturers reported that 70 pct of their present equipment didn't exist in 1950—or had been completely redesigned since then. And a spokesman for the business machine industry estimated the degree of "newness" of his products, using the same base, at 85 pct.

New product development is not an easy job. It's fraught with dangers and there's many a slip 'twixt the idea and the finished product. To learn how to guard against them we suggest you turn to p. 85. You'll find a special 8-page survey report on how to plan new products.

Dog's Life

You can't blame this U. S. Steel pooch if he looks a little miffed. If what he's glancing at were real hot dogs he'd be leading the life of Lassie.

But they are really high pressure

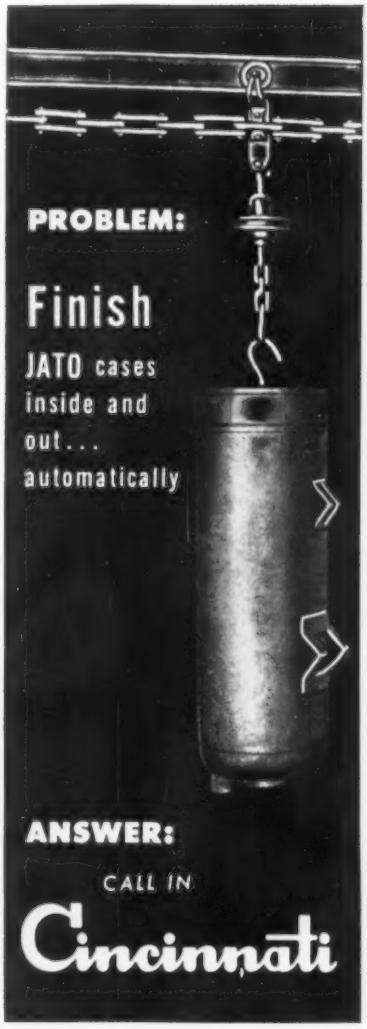
Poochy looks put out.

cylinders curved to fit a submarine's hull contour. Turned out by the company's National Tube Div. at its Christy Park Works, the cylinders hold highly compressed oxygen vital to sub crews during long undersea cruises.

New Puzzler

A chipmunk is sitting on a log 10 feet long and 3 feet in circumference. As the log rolls down a hill, the distance of 50 feet, the chipmunk runs from one end of the log to the other, always remaining on top.

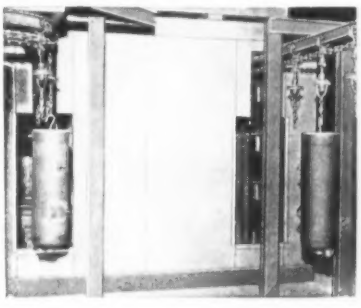
How far had he traveled when the log reached the foot of the hill?

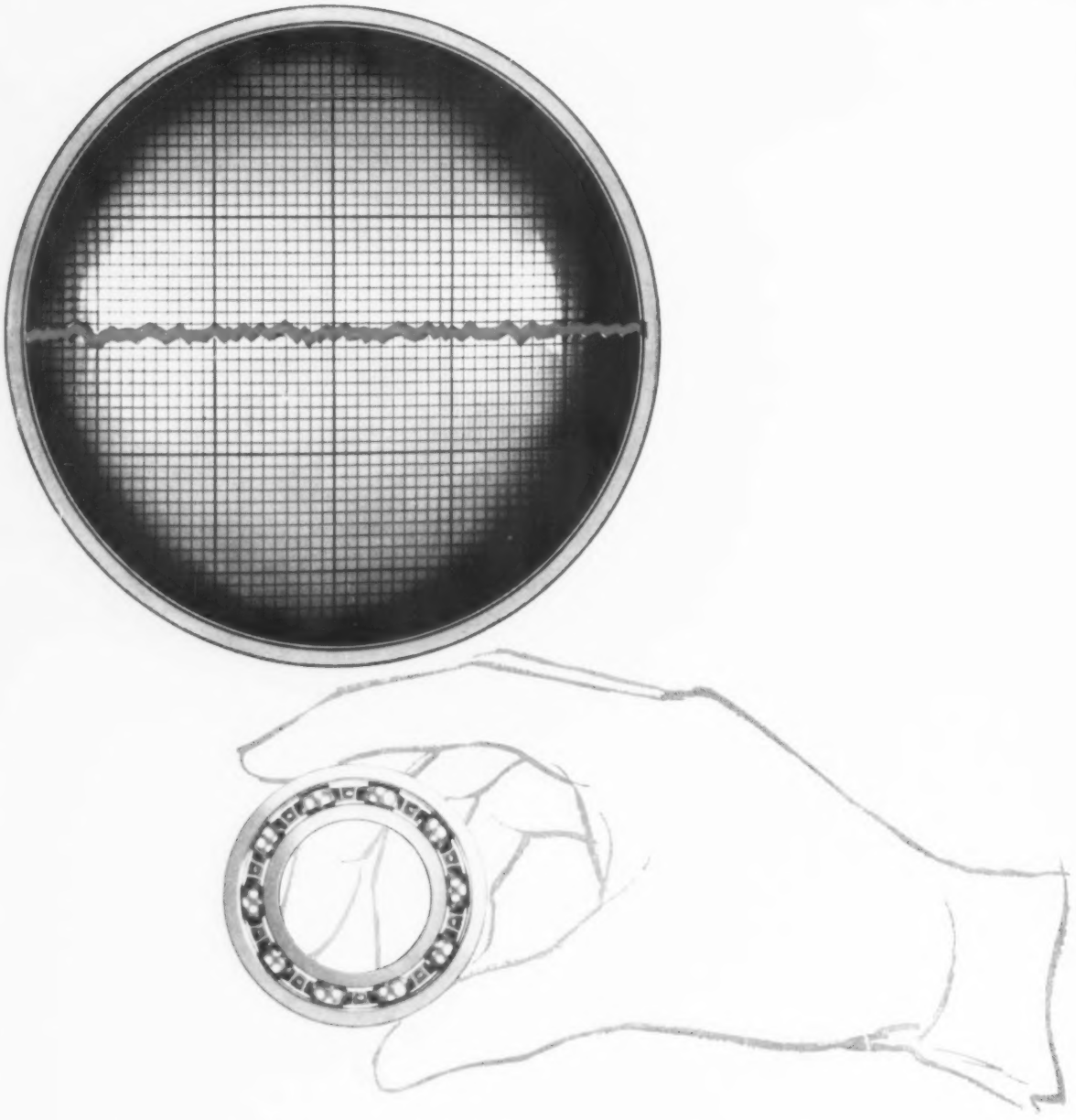


JATO cases at Phillips Petroleum move continuously from cleaning through painting to the bake oven . . . hang vertically on indexing conveyor to rotate as they are painted—inside and out—in just two automatic operations.

Let CINCINNATI expedite your cleaning and finishing. For free survey, write today!

CINCINNATI CLEANING and FINISHING MACHINERY COMPANY
2017 Hageman St., Cincinnati 41, Ohio





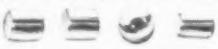
SCIENTIFIC "SOUNDINGS" PRODUCE QUIET BEARINGS

Through the application of the latest electronic instruments, SKF research engineers have been able to further reduce the sound factor in anti-friction bearings. SKF provides the quietest running, rolling contact bearing in the world of today . . . at no added cost.

Other recent laboratory achievements include improvements in sealing and increase in bearing operating life, further assuring users the best bearings for their dollar. But accept no substitutes – you benefit from these only when you insist upon SKF. 7763

SKF®

EVERY TYPE—EVERY USE



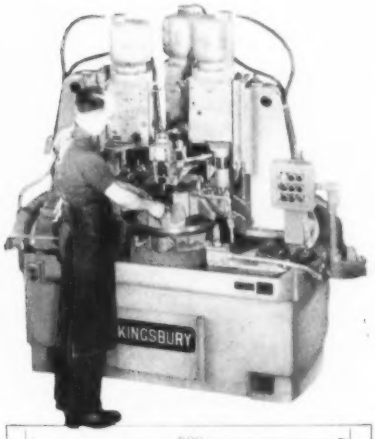
Spherical, Cylindrical, Ball, and "Tyson"* *Tapered Roller Bearings*

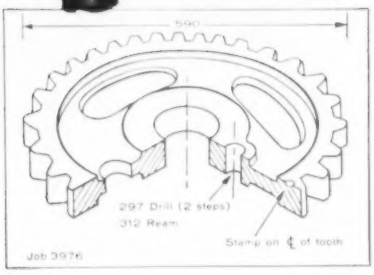
*Reg. U.S. Pat. Off. Tyson Bearing Company

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

450 PER HOUR GROSS

- drilled
- reamed
- stamped





The operator merely loads and unloads this Kingsbury. The stamping device operates at his station. Two automatic units drill and one unit automatically reams. Drilling in two steps shortens the time cycle and increases production.

Kingsbury indexing automatics save money on simple jobs like this and on large complex jobs, too. Machines are all tooled, ready to produce. We invite your inquiry. Kingsbury Machine Tool Corporation, Keene, N. H.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

EXHIBITS, MEETINGS

Packaging & Handling Show—Oct. 28-31, Atlantic City Convention Hall. (SIPMHE, One Gateway Center, Pittsburgh 22.)

AtomFair '57 — Oct. 28-31, New York Coliseum. (Atomic Industrial Forum, 3 E. 54th St., N. Y. 22.)

Metal Show—Nov. 2-8, Chicago Int'l Amphitheatre. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Exposition of Chemical Industries—Dec. 2-6, New York Coliseum. (International Exposition Co., 480 Lexington Ave., N. Y. 17.)

OCTOBER

National Machine Tool Builders Assn.—Annual meeting, Oct. 22-25, French Lick-Sheraton Hotel, French Lick, Ind. Society headquarters, 2071 E. 102nd St., Cleveland.

American Nuclear Society—Second winter meeting, Oct. 28-31, Henry Hudson Hotel, New York.

National Assn. of Aluminum Distributors — Annual meeting and convention, Oct. 30-Nov. 1, Camelback Inn, Phoenix, Ariz. Society headquarters, 1900 Arch St., Philadelphia.

National Tool & Die Manufacturers' Assn. — Annual convention, Oct. 31-Nov. 3, Edgewater Beach Hotel, Chicago. Society headquarters, 907 Public Square Bldg., Cleveland.

American Road Builders' Assn.—Fifth annual national highway conference, Oct. 28-30, French Lick-Sheraton Hotel, French Lick, Ind. Society headquarters, World Center Bldg., Washington, D. C.

NOVEMBER

Metal Treating Institute—Annual meeting, Nov. 1-3, Sheraton Hotel,

(Continued on P. 16)

GENERAL REFRACTORIES

bonding mortars FOR THE STEEL INDUSTRY

Grefco offers a wide variety of air-setting and of heat-setting high temperature bonding mortars of both the dry and wet varieties. Here are just a few:

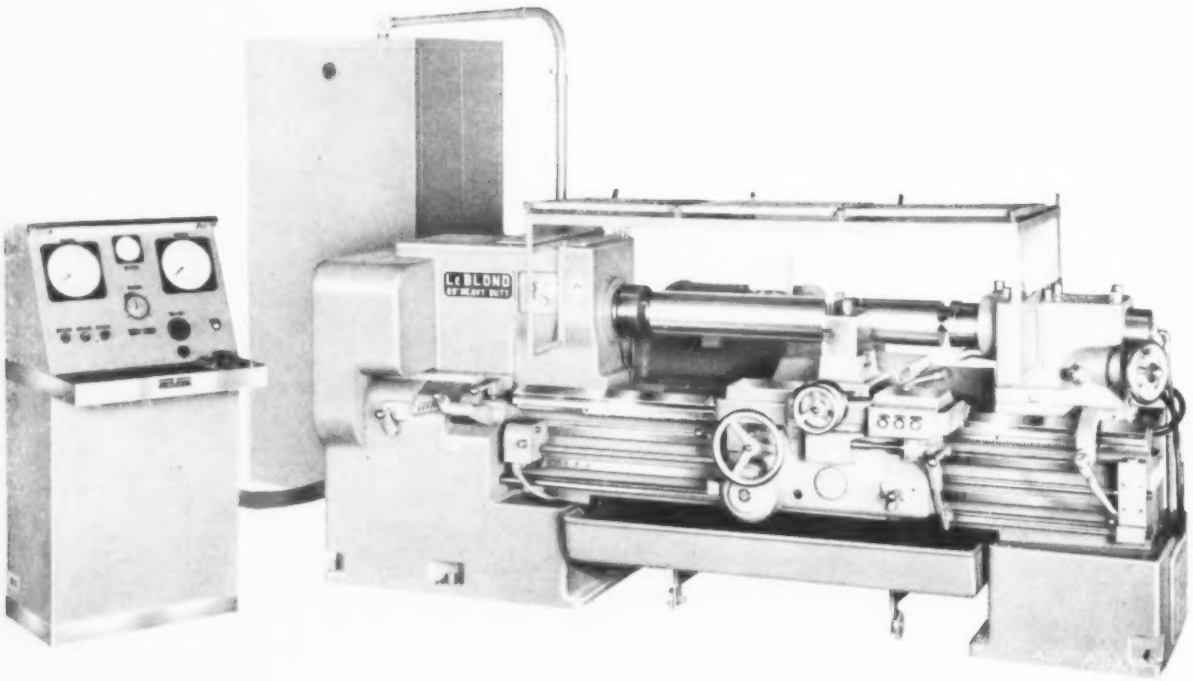
BRIKLOK is a super duty, air-setting, fireclay base mortar which sets hard and develops high strength merely upon drying. It is widely used for laying, coating and patching fireclay and silica brickwork. BRIKLOK has good resistance to slag and abrasion and withstands temperatures up to 3056°F. BRIKLOK A is a wet mixture while BRIKLOK is furnished as a dry powder.

GREFCO SILLIMANITE is a highly refractory mortar with a base material consisting mainly of mullite crystals. This insures very high refractoriness and freedom from shrinkage at high temperatures. This high quality mortar is recommended for laying up and coating fireclay, high alumina or SILLIMANITE brick, and should always be used wherever a mortar is required for the latter.

SILLIMANITE 343 is a wet air-setting mixture. SILLIMANITE 340 is a dry heat-setting mixture. Consult your Grefco representative as to which of the several varieties best suits your needs.

GENERAL REFRACTORIES COMPANY
Philadelphia 2, Pa.

This 150 H. P. LeBlond lathe



Special LeBlond 20" uses 150 hp motor, provides infinite speeds from 250 to 5000 rpm, 90 feeds from .002 to .136. Special bearings in head and tailstock are cooled and lubricated by pressurized oil circulating system; common oil reservoir is temperature controlled by a thermostatic heat exchanger. Remote-control station includes: motor-generator start and stop, spindle start and stop, length and cross feed engage and disengage, horsepower meter, spindle speed indicator, cutting speed indicator, spindle speed control, overload lights and timer.

To test new cutting media and tools to their limits, General Electric's Metallurgical Products Department (manufacturers of Carboloy cemented carbides) required a faster, more powerful lathe than any available. This high speed LeBlond 20" lathe was developed for this purpose. It will rev up to 5,000 r.p.m., make efficient use of its 150 h.p. and permit a 50% overload for short periods.

LeBlond lathes are noted for their inherent stamina and rigidity. In this case it was only necessary to make modifications in the headstock, tailstock spindle and controls—the rest of LeBlond's Heavy Duty 20" was already powerful enough to take the new high loads.

Just what will this lathe do? The following test data tell the story:

tests tools for tomorrow

WORKPIECE—SAE 1045, 180 Brinell, 48" long.
TOOL—CEMENTED OXIDE 0 - 30.

TEST DATA

Test **1**
Workpiece diameter, 7.65". 5000 rpm 10,000 sfm .010 feed. Carriage travel, 50" per minute over entire workpiece .110 depth of cut. 138 hp consumed

Test **2**
Workpiece diameter, 6.65". 4300 rpm 7500 sfm .010 feed. Carriage travel, 43" per minute over entire workpiece .110 depth of cut. 105 hp consumed

Test **3**
Workpiece diameter, 6". 5000 rpm 7800 sfm .015 feed. Carriage travel, 75" per minute .100 depth of cut. 148 hp consumed

* 113.6 miles per hour!

Perhaps you've been looking for a lathe with this kind of power and speed. Maybe you have another special turning problem with which LeBlond could help. Or you simply need a good dependable engine lathe. In any case, you can call on LeBlond with confidence. See your nearby LeBlond Distributor or write—

. . . cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio

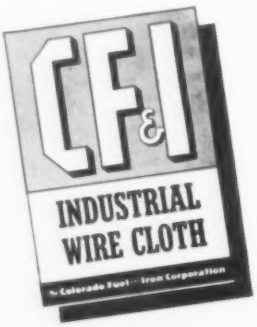
LEBLOND of Cincinnati

World's Largest Builders of a Complete Line of Lathes for More Than 70 Years

for INDUSTRIAL WIRE CLOTH problems...

- **Nationwide Sales Force**—CF&I Industrial Wire Cloth salesmen are located in 38 key cities from coast to coast and in Canada.
- **Experience**—CF&I Sales Representatives are all thoroughly familiar with Industrial Wire Cloth, and can help you solve your problems by recommending the type of cloth that's right for your application.
- **Information**—Our salesmen are all prepared to quote on prices and stock items—you save time in your quotations.
- **Facilities**—CF&I's sales force is backed up by complete manufacturing facilities. They can offer wire cloth in a wide range of meshes, metals and weaves.
- **Rapid Delivery**—CF&I carries large stocks of all standard types of wire cloth, available for immediate shipment.

For full details, phone our nearest sales office or write for your free copy of the CF&I Industrial Wire Cloth catalog.



In the East
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo Chicago • Detroit • New Orleans • New York • Philadelphia

In the West
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper Denver • El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland Pueblo • Salt Lake City • San Antonio • San Francisco • San Leandro • Seattle • Spokane • Wichita

CF&I OFFICES IN CANADA: Montreal • Toronto

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

5427

EXHIBITS, MEETINGS

(Continued from P. 13)

Chicago. Society headquarters, 271 North Ave., New Rochelle, N. Y.

The Society for Nondestructive Testing—Second international conference on nondestructive testing, Nov. 3-8, Morrison Hotel, Chicago. Society headquarters, 1109 Hinman Ave., Evanston, Ill.

Wire Reinforcement Institute—Annual fall meeting, Nov. 4-5, Safari Hotel, Scottsdale (Phoenix) Ariz. Society headquarters, National Press Bldg., Washington, D. C.

American Institute of Electrical Engineers — Annual machine tool conference, Nov. 4-6, Hotel Schroeder, Milwaukee. Society headquarters, 33 W. 39th St., New York.

Grinding Wheel Institute — Fall semi-annual meeting, Nov. 6-8, The Sheraton-Blackstone Hotel, Chicago. Society headquarters, 2130 Keith Bldg., Cleveland.

National Foundry Assn. — Annual meeting, Nov. 7-8, Waldorf-Astoria Hotel, New York. Society headquarters, 53 W. Jackson Blvd., Chicago.

American Home Laundry Mfrs' Assn. — Eleventh annual national home laundry conference, Nov. 7-8, Hotel Commodore, New York. Society headquarters, 20 N. Wacker Dr., Chicago.

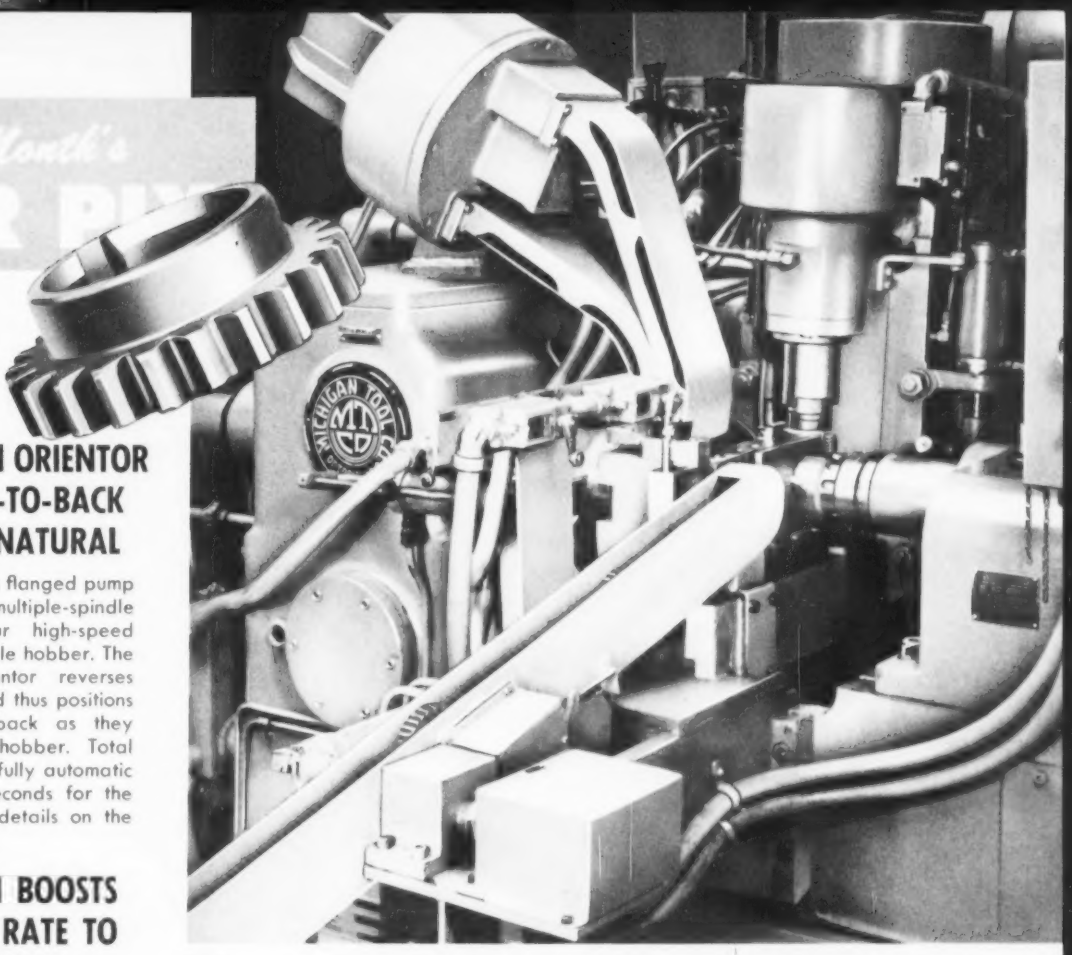
National Assn. of Waste Material Dealers, Inc.—National fall meeting, Nov. 8-15, Hotel Ambassador, Los Angeles. Society headquarters, 271 Madison Ave., New York.

Steel Founders' Society of America—T & O conference, Nov. 11-13, Carter Hotel, Cleveland. Society headquarters, 606 Terminal Tower, Cleveland.

National Electrical Manufacturers Assn.—Annual meeting, Nov. 11-15, Traymore Hotel, Atlantic City. Society headquarters, 155 E. 44th St., New York.

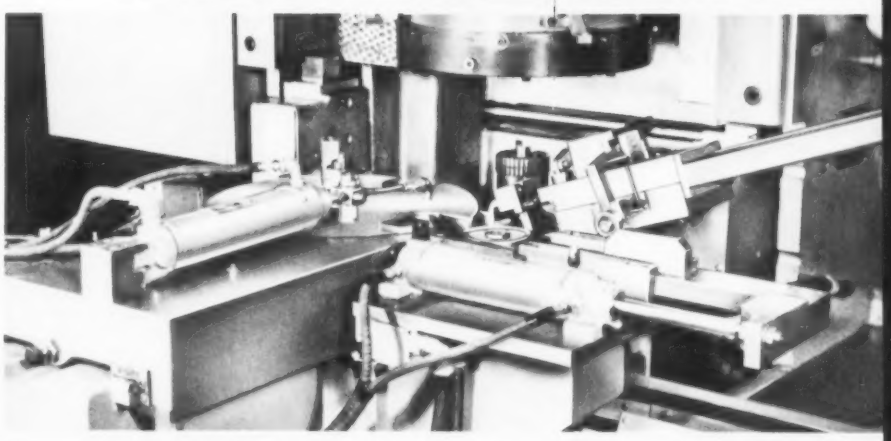
This Month's

GEAR PI



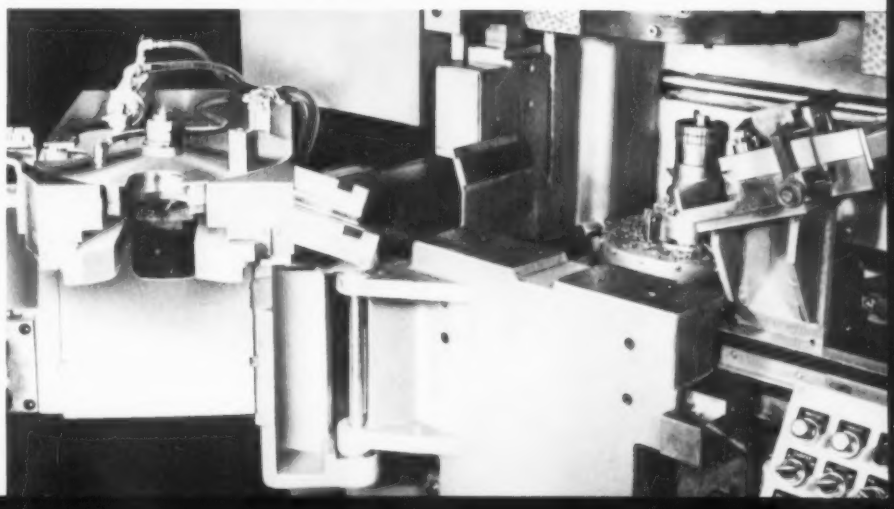
NEW MICHIGAN ORIENTOR MAKES BACK-TO-BACK HOBBING A NATURAL

Even on parts like this flanged pump gear, you can get multiple-spindle capacity from your high-speed Michigan single-spindle hobber. The new Michigan orientor reverses every other gear and thus positions two parts back-to-back as they go into the gear hobber. Total loading time for the fully automatic cycle is only four seconds for the two gears. Ask for details on the No. 1445 hobber.



AUTOMATION BOOSTS SHEAR-SPEED RATE TO 180 PER HOUR

Automatic two-at-a-time parts loading and unloading has this Model 1853 Shear-Speed running at 100% efficiency producing 180 clutch hubs per hour. The work? A 36-tooth involute spline on a face width of .580 inches with a diametral pitch of 9.750. Pressure angle is 14½°. Parts are automatically positioned in pairs, fed, advanced, indexed 90° and picked up on a hydraulic arbor. Loading time is 8 seconds. Automatic cutting cycle for both parts is 32 seconds.



AUTOMATION SWINGS CLEAR FOR TOOL CHANGE ON SHEAR SPEED

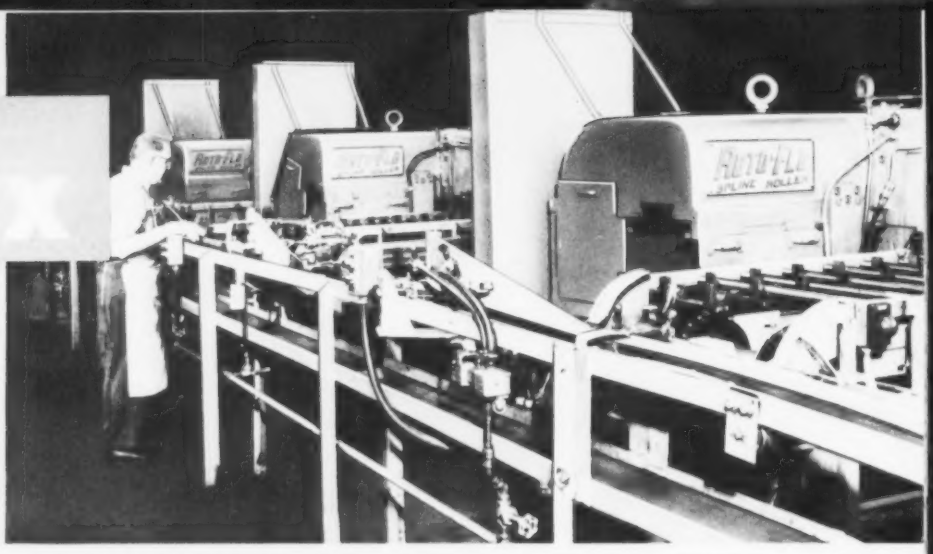
Any interference of automating devices with tool changes is avoided on this Shear-Speed with a swing-out arrangement. The hinged mechanism swings the loader, index table and index slide completely clear of the machine. Pin-locked stops assure positive alignment.

MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD.

This Week's

GEAR PIX



THESE 3 ROTO-FLOS WILL SPLINE 2½ MILLION AXLE SHAFTS IN 1957

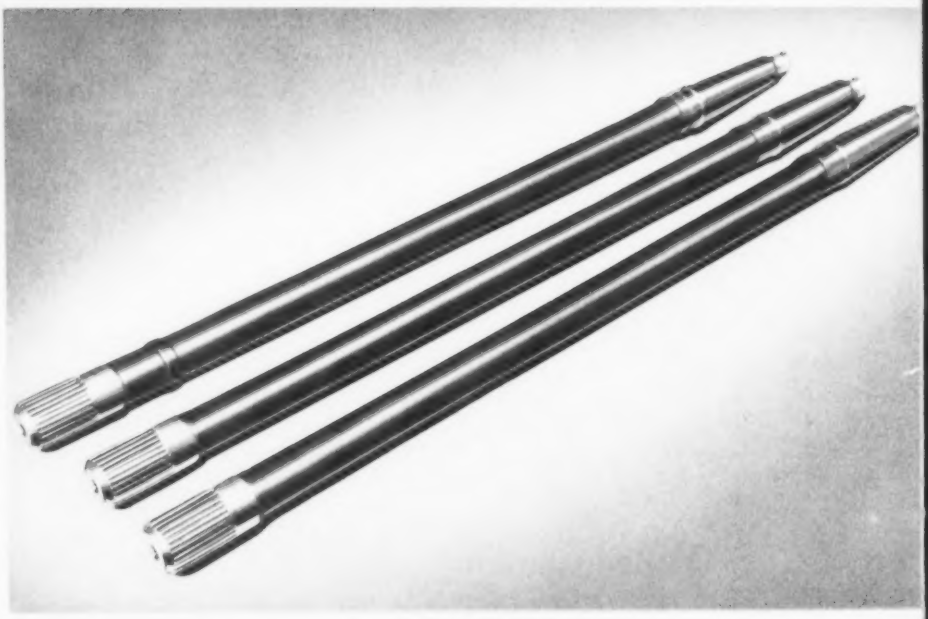
At a nominal tool cost, these 3 machines are producing all the splines on all the rear axle shafts for 5 lines of cars.

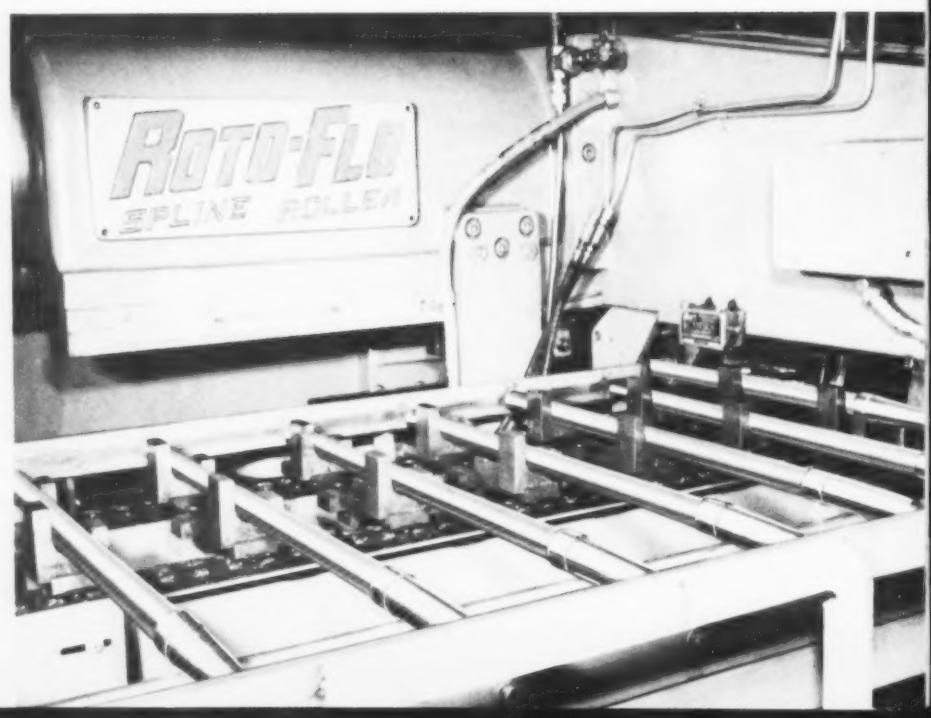
Here is the story:

No. of Roto-Flos	3
No. of operators	1
Output rate	1080/hr.
Surface finish	5 microinches RMS
Shafts per grind	123,000
Tool change time	20 minutes
Outside dia.	1.290 in.
No. of teeth	30
Spline length	1.62 in.
Diametral pitch	24/48
Pressure angle	30°

• • •

Roto-Flo is a development of Michigan Tool Company, the nation's gear production headquarters. The Roto-Flo process cold forms toothed and grooved parts—gives you a superior product in a matter of seconds instead of minutes. Roto-Flo machines will lower your capital investment, reduce direct labor costs, cut floor space needs, drop upkeep to the minimum, give you amazingly high tool life. For the story on Roto-Flo ask for "Chipless Production" (Bulletin RF-55). Write for your copy today.





MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.
IN CANADA: COLONIAL TOOL CO., LTD

who gets hooked?

What happens when a stamping plant fishes for business with price as the bait?

Sure the lure is attractive...*but who gets hooked?* The old rule, *Caveat Emptor*, says "Let the buyer beware." In the cold light of business, it's well that he should.

When a stamping plant pegs prices at or below cost figures to obtain an order, what usually happens? Obtained at a price, the order must be produced at a price. Cutting corners usually means cutting quality. The order takes a back seat to more profitable business. When the delivery date arrives, the buyer receives alibis—not stampings.

Who pays for delays when deliveries are late or when defective parts must be corrected? The buyer, of course!

How can *you* avoid being snagged? When you're buying stampings, make sure that the quoted price covers the type of service and quality that you expect to receive. At Crosby, it *does!*

METAL STAMPING SINCE 1896 · THE CROSBY COMPANY · BUFFALO, N.Y.

THE CROSBY COMPANY

195 Pratt Street, Buffalo 4, N. Y.

OFFICES

Chicago • Cleveland • Detroit • New York • Philadelphia

Republic
COLD FINISHED STEEL...

REPRESENTATIVE PRECISION PARTS made of Republic Cold Finished Steel are shown here. Parts like these have an enviable record of reliability—helping National Cash Registers to total more sales than any other machines, for more than a half century.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

PERFORMANCE PROVED

in National Cash Registers for over 50 years

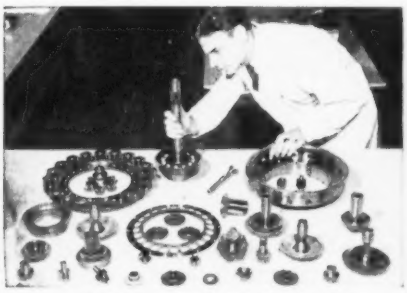
The proof of the product is in its performance. That's why we take particular pride in supplying cold finished steel to The National Cash Register Company of Dayton, Ohio.

Republic Cold Finished Steel has been helping National Cash Registers ring up sales for more than a half century. Ever since the Union Drawn Steel Company, now our Union Drawn Steel Division, pioneered the cold drawing process, National Cash Register products have totaled enviable service records backed by the uniform excellence of Republic Union Drawn Carbon and Alloy Steel components.

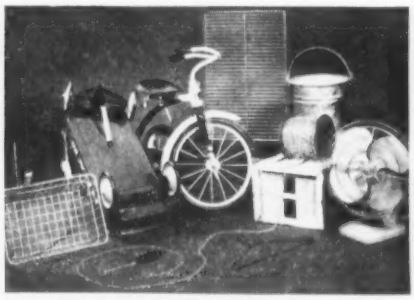
You, too, can capitalize on the many outstanding advantages of Republic Cold Finished Steel. For example, in comparison with hot rolled bars, you get maximum machinability. This feature alone makes possible higher speeds and feeds, finer finished surfaces and longer tool life.

In addition your parts will have higher ultimate strength, yield point and hardness when you use Republic Cold Finished Steel. Extreme accuracy in size and cross section plus an as-received bright, smooth finish enable you to eliminate all further finishing for many applications.

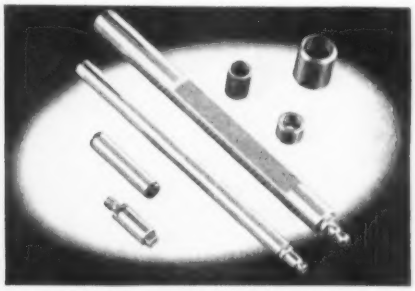
Join the growing list of users scoring production gains through the use of Republic Cold Finished Steel. Contact your Republic representative or your Republic Union Drawn Distributor. Or mail the coupon for full details.



HEAVY-DUTY PERFORMANCE plus minimum weight are provided by these gear train components made of modern, flight-weight alloy steels. Republic, world's largest producer of alloy steels, can help you determine the precise analysis best suited to your application. Result: A superior product combining strength, toughness, and durability — plus production economy.



REPUBLIC MANUFACTURERS' COARSE WIRES are produced in modern wire mills in a wide range of sizes, grades, and finishes. Box Binding and Stapling, Brush Handle, Chain, and Garment Hanger are only a few of the qualities regularly produced. Large tonnages are shipped to manufacturers of fan guards, wire partitions, concrete reinforcing specialties, plated shelves, racks and grilles, wagon axles, and numerous other products. Our expert wire metallurgists are available to assist you in solving your production problems.



CORROSION-RESISTANT PERFORMANCE in addition to machinability, strength, and toughness are four good reasons why the manufacturer of these carburetor parts has standardized on Republic Free-machining ENDURO® Stainless Steel Bars. ENDURO is available in a complete range of analyses in cold finished and hot rolled bars, special sections and wire. For complete information, mail coupon today.

STEEL

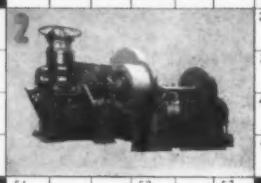
and Steel Products

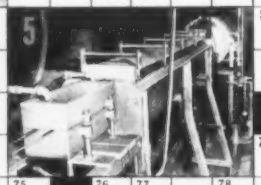
REPUBLIC STEEL CORPORATION
DEPT. C-2995-A
3104 EAST 45TH STREET • CLEVELAND 27, OHIO

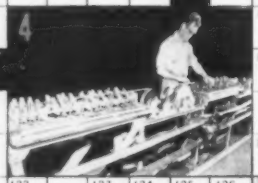
Please send me further information on:
☐ Cold Finished Steel ☐ Alloy Steels
☐ Republic Manufacturers Wire ☐ ENDURO Stainless Steel

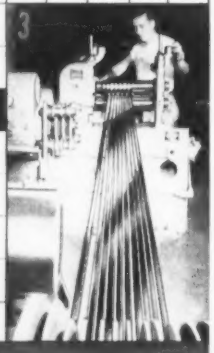
Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

SANDVIK Clues To The Solution Of Your SPRING STEEL PUZZLES









The pictures above give you some strong hints of Sandvik's ability to supply *exact* answers to your spring steel requirements.

Here's what they represent:

1. EXTENSIVE STOCKS OF SPECIALIZED STRIP STEELS – Cold-rolled annealed, unannealed or hardened and tempered, high carbon and alloy strip – in a wide variety of sizes, tempers and special analyses to fit specific performance demands.
2. ROLLING MILLS – To roll to order the precise gauge you require, if it's not available from stock.
3. SLITTERS – To tailor strip widths to your specifications.
4. EDGE FILING EQUIPMENT – To provide the edge finish required . . . square, round or dressed.
5. HARDENING & TEMPERING FURNACES – To give the proper degree of hardness and flexibility to the strip.
6. QUALITY CONTROL – To give a continuing assurance that Sandvik's high quality standards will be consistently maintained.

With these extraordinary facilities, Sandvik can supply the exact size and type of steel . . . either off-the-shelf or tailored-to-order . . . to suit almost any spring steel requirement.

For specific information contact your nearest Sandvik office.

SANDVIK STEEL, INC., 1702 NEVINS ROAD, FAIR LAWN, NEW JERSEY

Tel. Fair Lawn 4-6200 — In N. Y. C.: Algonquin 5-2200

Warehouses: Fair Lawn, N. J. • Cleveland • Los Angeles • Branch Offices: Cleveland • Detroit • Chicago • Los Angeles
In Canada: SANDVIK CANADIAN LTD., Montreal, Toronto, Vancouver • SANDSTEEL SPRING DIV., Fair Lawn, N. J. • Industrial Springs
SANDVIK COROMANT DIV., Fair Lawn, N. J. • Carbide Tools Works: Sandviken, Sweden • Hallefors, Sweden

SS-118

a moment with management . . .

THE GREAT TESTING FALLACY

Testing is a wonderful thing. It keeps any manufacturing mistakes from ruining your reputation. It protects your customers from trouble and danger. It saves you the embarrassment and high cost of explaining, apologizing and correcting.

But testing that does these things, **and only these things,** misses a vast opportunity to save money and build profits for a manufacturer. It even hurts the customer, for it fails to give him the perfect buy of a sound product **at a minimum price.** For inevitably the price must reflect any **manufacturing waste.** Some part of the loss always gets passed along. The poverty is shared, so to speak.

What are we getting at? Simply this: End inspection is merely locking the door after the horse is stolen. Or, in plain shop language, finding out that you have already spent a lot of unnecessary money working on pieces predestined for the junk pile.

How much is wasted? It is the cost of all operations performed on the piece beyond the moment when an adequate testing procedure could have spotted the defect.

Final tests are unavoidable, essential. **But never enough.**

Manufacturing horse sense requires a testing setup that will spot defects at the earliest possible moment during process.

That means before the following algebra has time to get in its dirty licks:

W-H (L + O)
or
Waste-Hours x (Labors + Overhead)

Such waste can add up to thefts of profits far greater than any ever dreamed of by the Forty Thieves of Ali Baba mentioned in our neighboring column.

Ali Baba only had 40 thieves

...and they could be cured through a light application of boiling oil. Chances are, most manufacturers have more than 40 unwitting thieves in operation at work in the plant. They won't be neatly aligned in so many stone jars, but these phantom pilferers are there nonetheless.

You'll find them "accidentally" whittling away at profits in many ways. Check your own operation...are reject rates reducable...have you need for continual rework...are you afflicted with machine downtime...how about scrap losses from defective materials, are they there, too?

True, each may only chisel a few dollars a day, but when you find them at work in scores of operations they add up. Their total may be a serious profit drain which can be plugged to achieve maximum return on your investment.

Magnaflux sells nondestructive test systems which pinpoint faulty materials and processes *before they start costing extra.* These new production tools are used to find defects at any stage of "in-process" operations. Thus they curtail wasted time, labor and materials. These industrial "burglar alarms" can protect profit margins and control consistent product quality, too!

Send for a copy of LOWER MANUFACTURING COSTS—our new booklet which explains where, when, why and how Magnaflux tests can help cut production costs.

moral: Oil can keep things running smoothly, but it takes Magnaflux Test Systems to keep them running profitably!

THE HALLMARK OF QUALITY IN NONDESTRUCTIVE TEST SYSTEMS

Take Your Inspection Problems to the House of Answers . . .

MAGNAFLUX CORPORATION

7302 W. Lawrence Avenue • Chicago 31, Illinois

New York 36 • Pittsburgh 36 • Cleveland 15 • Detroit 11 • Dallas 19 • Los Angeles 22

SCREWSTICK is easy to insert into power driver, lets you drive a fastener as fast as you can find the hole.

SCREWSTICK saves money. It can cut assembly costs by as much as 4 to 1.

It can do this because SCREWSTICK feeds fasteners automatically from a power driver in a one-piece stick of identical fasteners. It eliminates manual handling of small screws, stops costly fumbling and combines high fastening strength with quick assembly.

Just as important is the ease of alignment between the screw and threaded hole and a constant, measured torque which is built into the product that provides uniform tightening.

SCREWSTICK is readily adaptable to compact, lightweight, portable drivers. Sizes from No. 0 to No. 6 in diameter, custom-engineered in machine screw or self-tapping types to meet your own requirements. They are mass-produced in the convenient, easy-to-handle SCREWSTICK form.

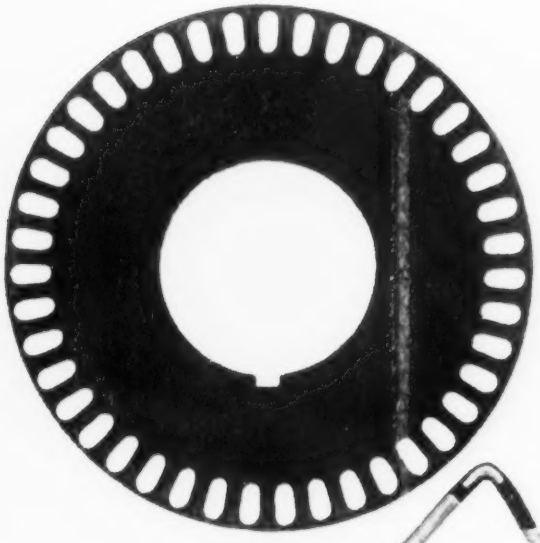
Find out for yourself how you can apply precision and ease of assembly to reduce assembly costs. Take advantage of American's custom engineering service for your fastening applications.

The biggest news in fasteners comes from . .

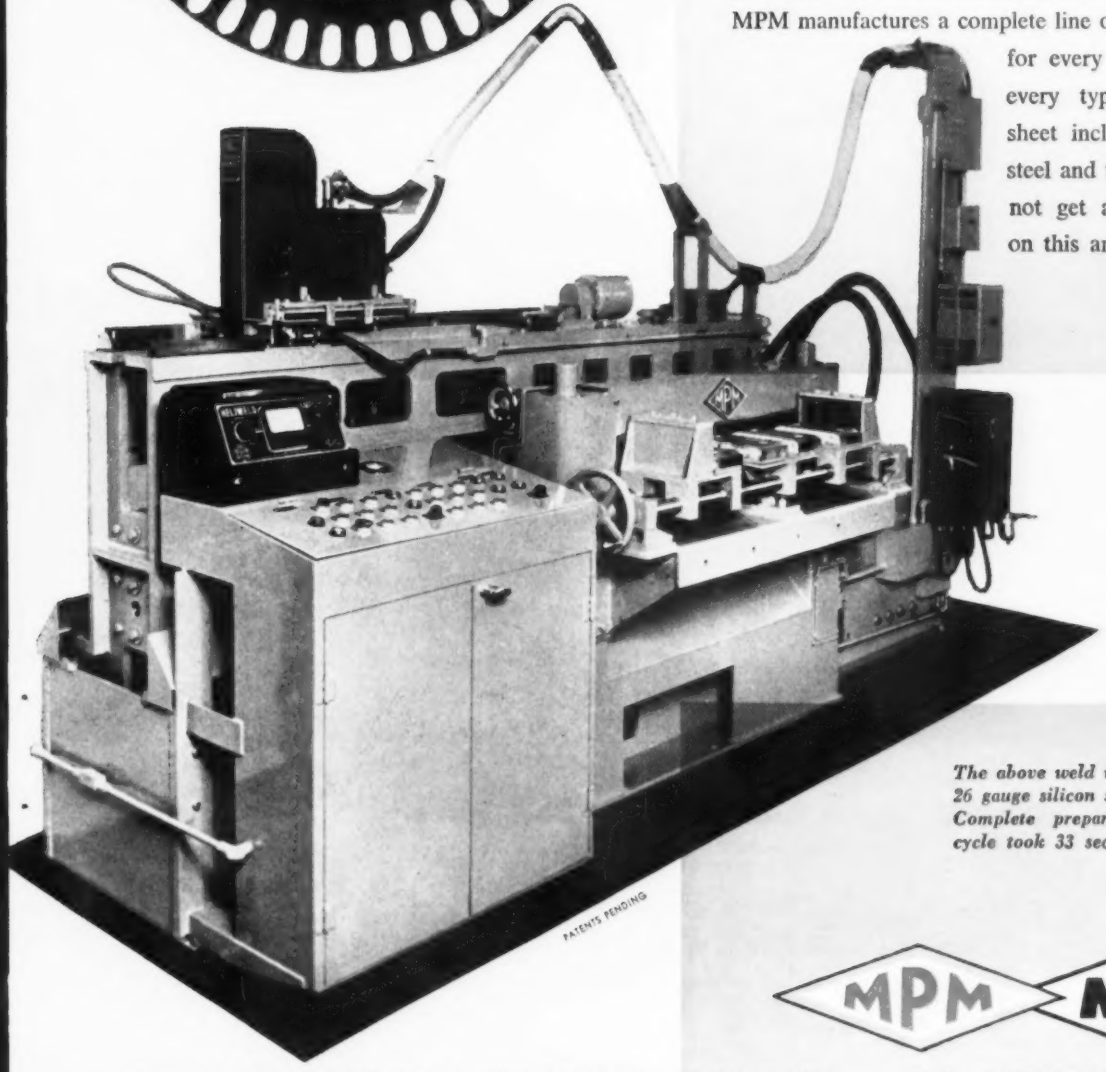
American!

AMERICAN SCREW CO., WILLIMANTIC, CONN.
NORRISTOWN, PA. • CHICAGO, ILL. • DETROIT, MICH.

Silicon steel coil buildup made faster, more accurate by amazing MPM shearwelder



• The unretouched photo of the rotor lamination is a typical production butt-weld made on 26 gauge silicon steel by MPM's outstanding new Shearwelder. Perfect welds like this are a result of the exclusive positive guiding and clamping arrangement and welding technique developed by MPM engineers. Both shearing and welding are performed at the same station eliminating the chance for error that occurs when the work is moved from station to station, too, this MPM method speeds the operation. MPM manufactures a complete line of Shearwelders for every need, and for every type of strip and sheet including stainless steel and tin plate. Why not get all the facts on this amazing machine?



The above weld was made in joining 26 gauge silicon steel sheet 33" wide. Complete preparation and welding cycle took 33 seconds.

MPM McK

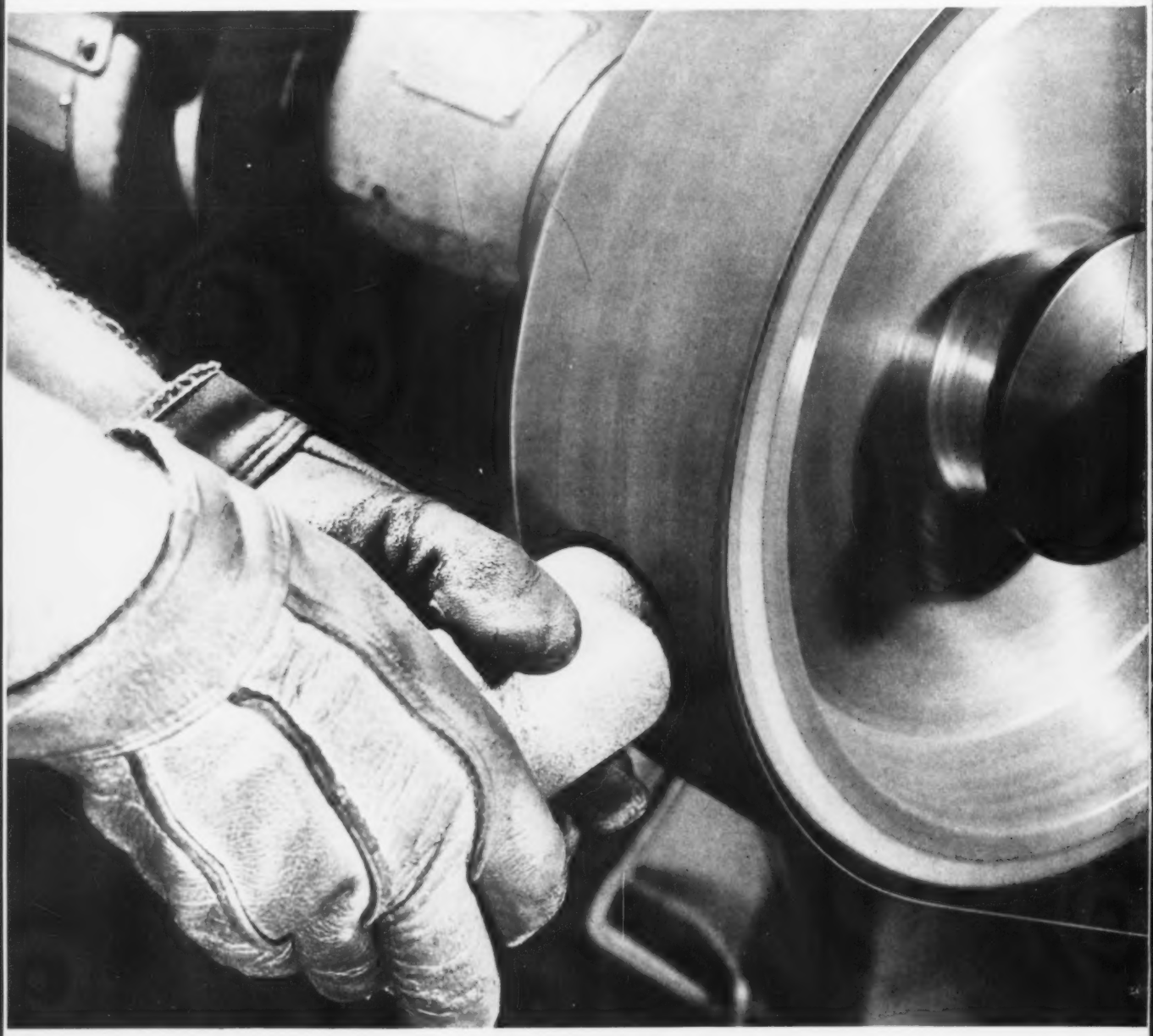
METAL PROCESSING MACHINE COMPANY • YOUNGSTOWN, OHIO

Subsidiary of THE McKAY MACHINE CO.

344

BEHR-MANNING CO., TROY, N. Y.

Now—*from Behr-Manning's*



New "SPUR-ACTION" abrasive belt cuts 25% Faster.

Removing excess material from a cast brass spring housing for a pressure reducing valve is fast and easy with a new "81-Coat" Resinall Metalite abrasive belt. The new Behr-Manning abrasive belts not only do a faster stock removal job but also stand up longer than any previously used.

"Abrasive Tech"—

BEHR-MANNING CO., TROY, N. Y.

☐ Please have a Field Engineer contact me to arrange for a demonstration of your new "81-Coat" belts and discs.

☐ At my plant ☐ At your nearest "Abrasive Tech" Branch Methods Room

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

"81-COAT" Abrasive Belts and Discs outlast all others by as much as 50%

From the Research Laboratory of Abrasive Tech comes an entirely new way of making coated abrasives—"81-Coat."

It gives a new toughness . . . a new sharpness to abrasive belts and discs. It gives them "Spur-Action"—hundreds of rougher, tougher cutting "spur" points per square inch for fastest stock removal.

And for greater endurance, greater resistance to grinding heat, and longer life, it provides the strongest resin bond ever attained for abrasive belts and discs.

Feel the difference . . . see the difference . . . profit by the difference. Just mail the coupon to arrange a demonstration of new "81-Coat" belts or discs on your toughest job . . . to spur more production, more mileage per belt—*at no increase in price!*

BEHR-MANNING CO.

TROY, N. Y.

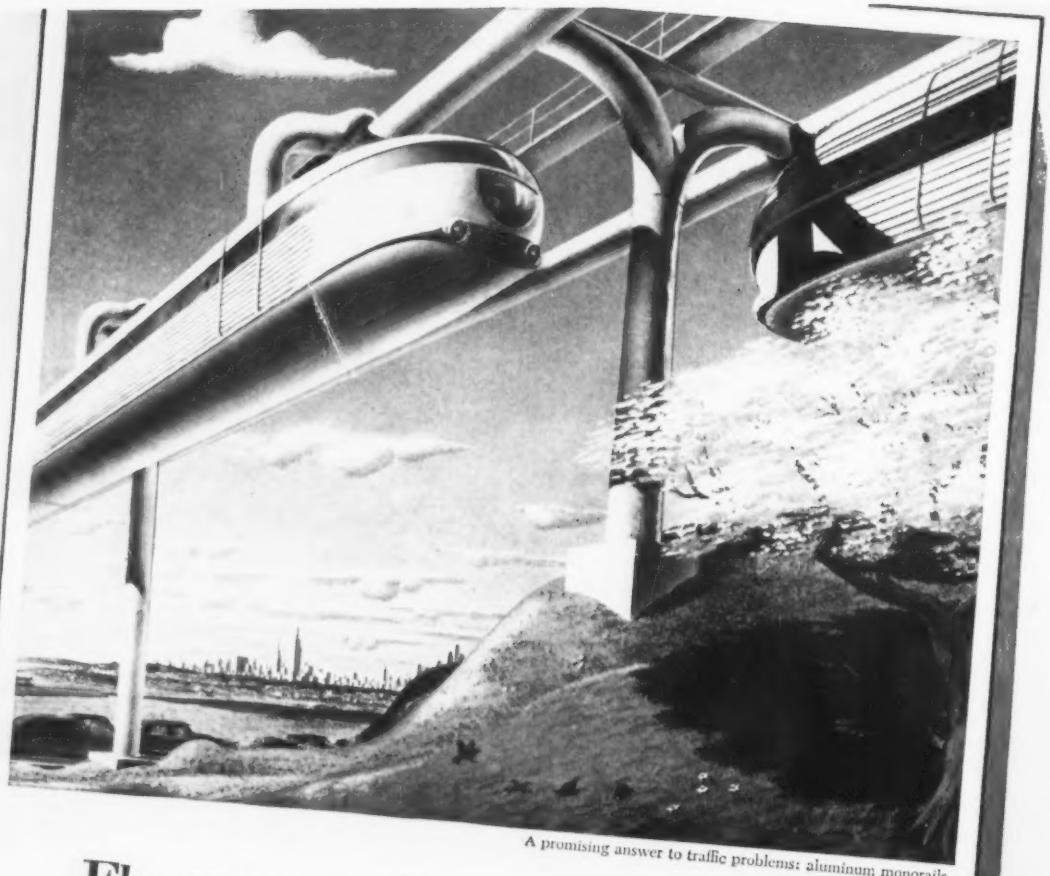
A DIVISION OF NORTON COMPANY

NORTON ABRASIVES

BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories

In Canada: Behr-Manning (Canada) Ltd., Brantford. For Export: Norton Behr-Manning Overseas Inc., Troy, N. Y., U. S. A.

BEHR-MANNING ®



A promising answer to traffic problems: aluminum monorails.

Fly over traffic...on sky hooks!

Bring an airport into the center of town . . . a country home within *minutes* of your office . . . move a seaside beach to the edge of an inland city!

A monorail made of light, strong, corrosion-resistant aluminum can do it! Test installations already in service indicate these flying trains will eventually skim over traffic at speeds of over 100 miles per hour.

Aluminum gets people places *faster*. And it does countless *other* jobs superbly well. That's why aluminum is the world's fastest growing metal.

To meet steadily expanding requirements for the vast amounts of electricity needed to separate aluminum from its ore, Aluminium Limited, an independent Canadian company, is completing one of the world's largest hydroelectric projects. This project will create 3,580,000 horsepower for the production of aluminum . . . power not needed by growing cities or other industries.

The world's second largest producer of aluminum ingot, Aluminium Limited sells no end products in the United States. It concentrates, instead, on supplying hundreds of independent U. S. fabricators with a steady, dependable flow of raw material essential to business, to industry and defense.

Aluminium Limited, Montreal: *Canada's independent producer of aluminum ingot for U.S. industries.*

Aluminum from Canada

Aluminum shines brightest in metalworking's crystal ball

Here's just one example of the big jobs that lie ahead for aluminum . . . projects that mean continually growing sales volume for United States aluminum fabricators.

Aluminium Limited *Sales, Inc.*

630 Fifth Avenue, New York 20, N.Y., Atlanta, Detroit, Chicago, Los Angeles, Cleveland, Buenos Aires, São Paulo

VERSATILITY UNLIMITED!

"BUFFALO" No. 1 "RPMster"

"1001" Speeds, Easily and Instantly Changed by Moving Just Two Controls!

Check with the man who uses one. He'll tell you why the "Buffalo" "RPMster" is the drill he *likes* to operate . . . how it ups his output . . . improves the quality of his work.

Because you have to operate this machine yourself — under actual shop conditions — before you'll really understand why it's the favorite of shopmen and supervisors alike. Only when you *do* operate it will you discover its many exclusive advantages.

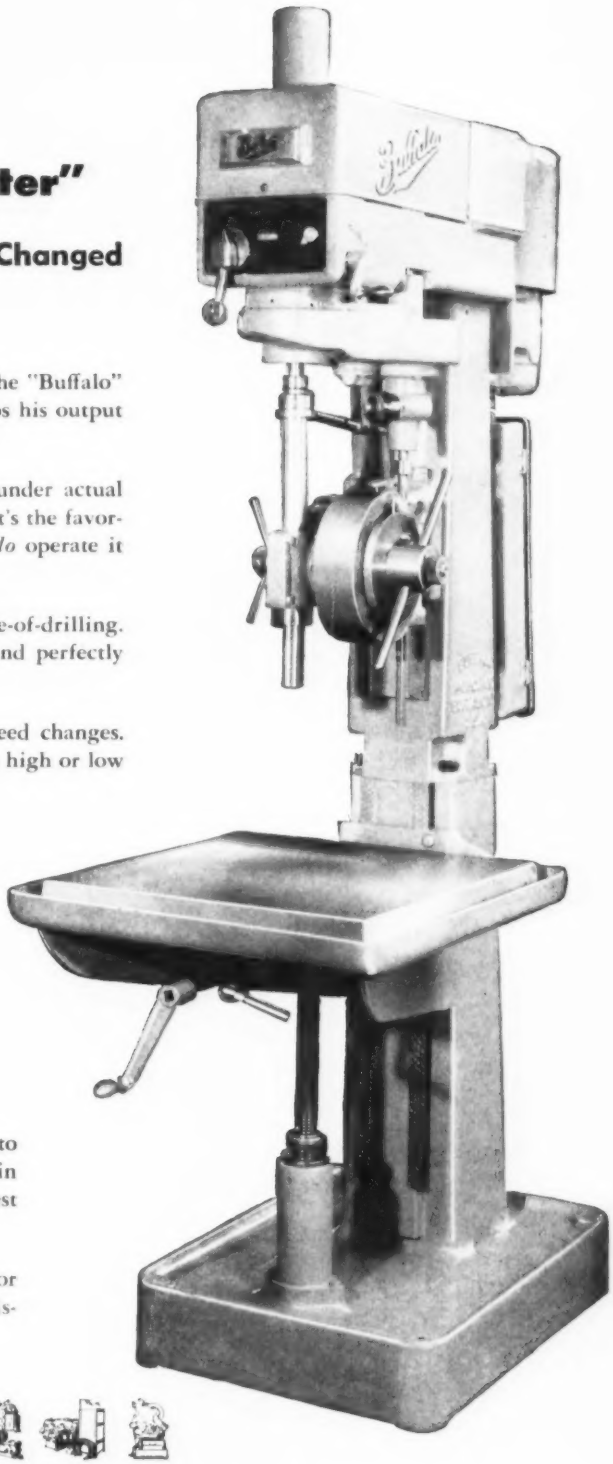
One of these is extreme smoothness, quietness and ease-of-drilling. That's the result of the gearless variable speed drive and perfectly fitted spindle.

Another "RPMster" advantage is the instantaneous speed changes. The shift lever at the left of the head places the drive in high or low range. The dial at the right provides infinite speed variations in either range. These handy controls adjust precisely to speeds ranging from 100 to 3000 RPMs, for all your drilling, reaming and tapping operations.

Sturdily built for a long life of accurate, maintenance-free service, the "RPMster" is available in one- to six-spindle models. And, considering all the unique versatility it can add to your production and shop jobs, you'll find that it's mighty economical, too.

Try the "Buffalo" No. 1 "RPMster", and you'll want to put one or more of these outstanding drills to work in your plant. For a demonstration, contact your nearest "Buffalo" machine tool dealer — or write us today.

The "Buffalo" "RPMster" features the famous "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.



ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

492 BROADWAY, BUFFALO, N. Y.

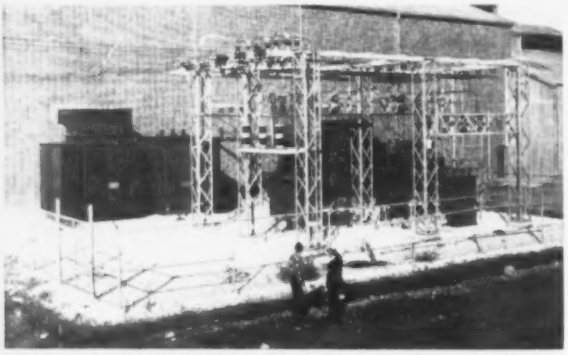
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

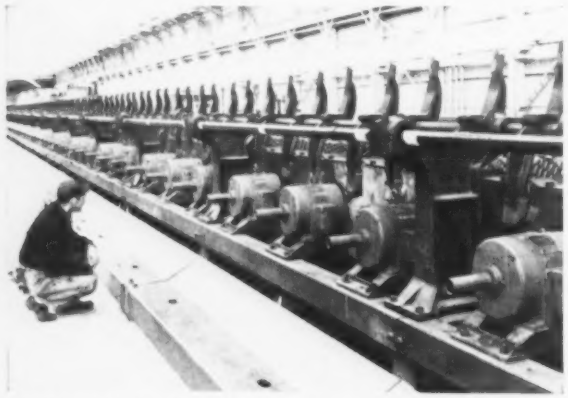
ENGINEERING REPORTS:

ONE OF THE FASTEST combination mills in existence, Atlantic Steel's new mill produces both rod and merchant products. Above is view of mill with skew "Y" tables in foreground.

AT ATLANTIC STEEL: pulling in

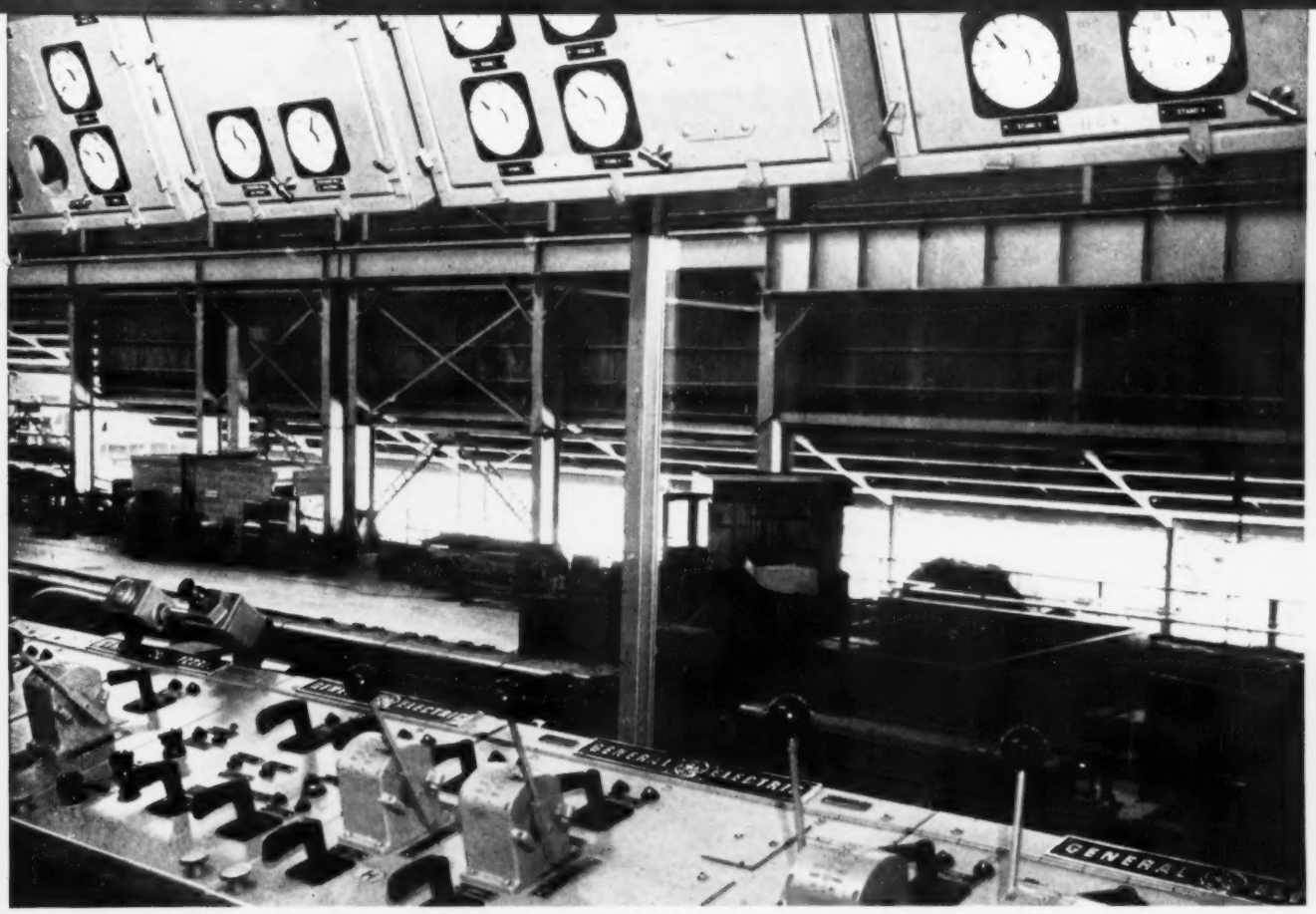


LOAD RATIO CONTROL provides best power factor, eliminates need to shut down mill to change voltage level. Rectifier regulating transformers and power circuit breakers are part of all General Electric outdoor package substation.



EASY REMOVAL of motors is facilitated by individual plug type connectors for each of 123 Tri-Clad® '55' 1-hp, adjustable frequency, a-c motors installed on cooling bed runout table.

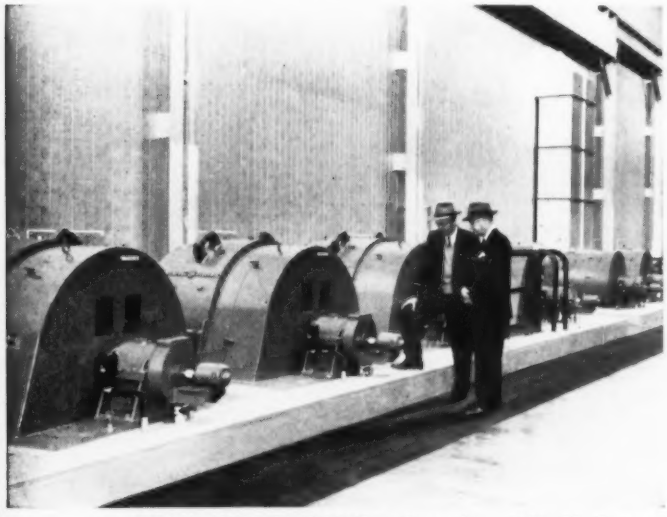
HIGH EFFICIENCY power supply is provided by these 1500-kw and 3500-kw mercury arc rectifier unit substations. Package construction provides lower installation cost, greater safety.



CENTRALIZED OPERATOR'S CONTROL of the mill is carried out from this air conditioned pulpit, located above the mill floor.

New drive system reduces buckling and one of world's fastest combination mills

General Electric's new speed regulators also shorten rescheduling time



ATLANTIC VICE PRESIDENT of Operations J. H. Girdler and General Electric Sales Engineer R. P. Crockett inspect General Electric main-drive motors totalling 8450 horsepower.

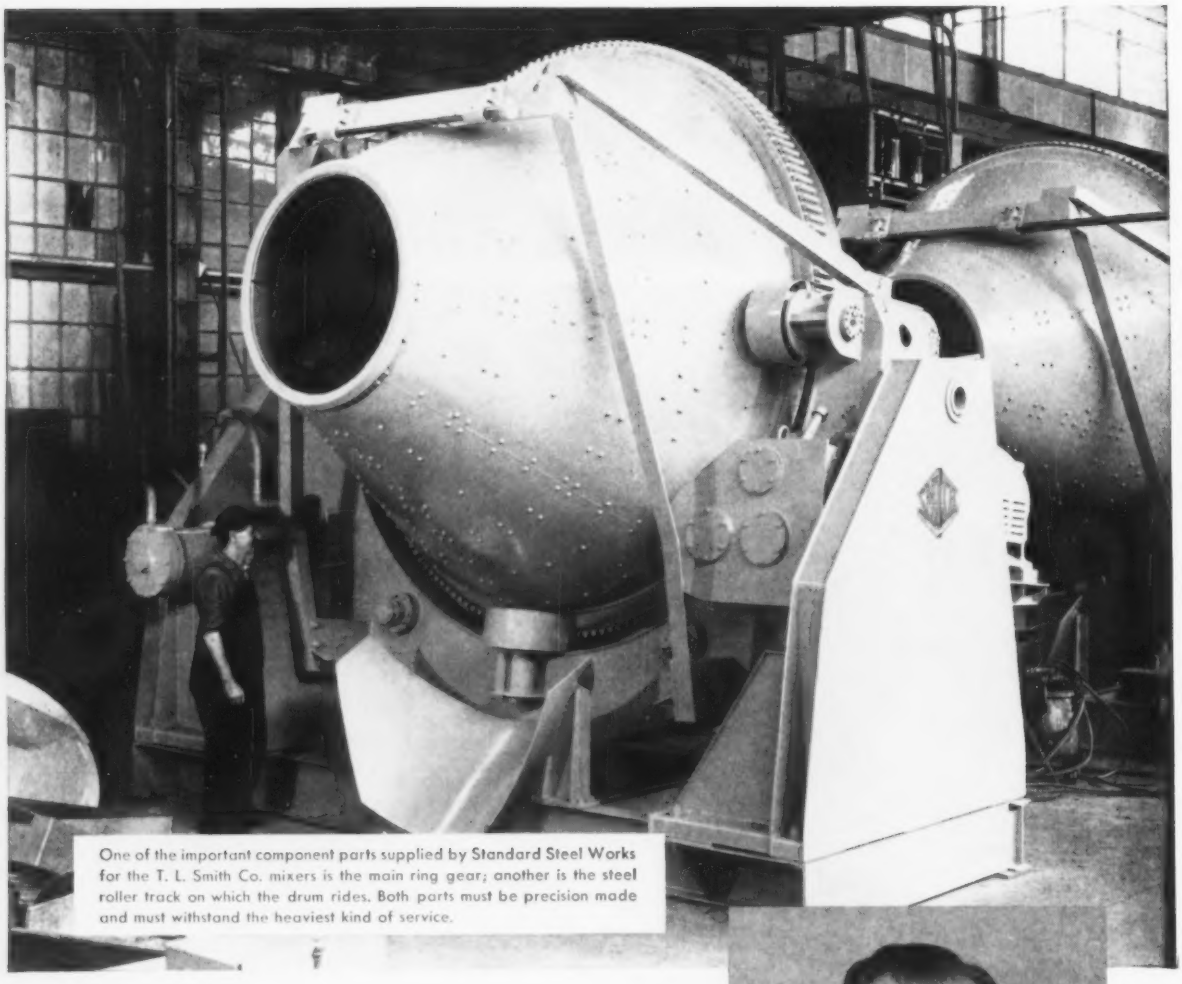
The Atlantic Steel Company's new combination merchant bar and rod mill, powered by a General Electric co-ordinated drive system, is the South's newest and most modern rolling mill. Its maximum delivery speed of 5000 fpm for rods and 2000 fpm for merchant products makes it one of the world's fastest combination mills.

THE DRIVE SYSTEM has standard mill motors with new amplistat-amplidyne regulator designed to hold 0.25% steady-state speed error from no-load to full-load. The regulating system makes it possible to set no-load speed essentially equal to rolling speed for fast set-up and re-scheduling. In addition, the system provides faster response —to reduce over- and underfeed due to impact speed drop.

THIS MODERN, NEW MILL DRIVE system was the result of close co-operation between Atlantic Steel personnel, The Morgan Construction Co., Rust Engineering Co., and G-E engineers. *G-E engineers are also ready to work with you and your consultants to help meet production requirements. Get complete information from your nearest Apparatus Sales Office.* General Electric Co., Section 659-116, Schenectady, New York. *Registered trade-mark of General Electric Company

Engineered Electrical Systems for the Steel Industry

GENERAL ELECTRIC



One of the important component parts supplied by Standard Steel Works for the T. L. Smith Co. mixers is the main ring gear; another is the steel roller track on which the drum rides. Both parts must be precision made and must withstand the heaviest kind of service.

"The T. L. Smith Co. is constantly seeking design improvements and production economies. Standard Steel Works has proved a big help to us in both respects."

As suppliers of component parts to the T. L. Smith Co.—world's oldest and largest manufacturer of concrete mixers—we have made it *our* business to get to know *their* business well enough to consider ourselves a part of their team.

It is our policy to work in the closest possible cooperation with all of our customers to assure maximum quality at lowest possible cost. Let us discuss your casting and forging needs with you. You'll find that service to our customers is as important as the quality of the products we make. Write Dept. 1-K.

"We are particularly impressed with Standard's methods-people and the way their engineers so effectively supplement our own in constantly suggesting design improvements and production economies," says R. R. Kupfer, purchasing agent for the T. L. Smith Co., Milwaukee, Wis.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

Expanded metal can fit into your plans, too

Penmetal expanded metal used for delicate-fabrics compartment of clothes dryer. Strong, smooth open mesh allows warm air to circulate freely.

Penmetal expanded metal, introduced at the planning stage, can often mean the difference between failure and success of products like these. That's why so many top designers are taking advantage of its valuable properties—why you should, too!

Decorative . . . its clean, modern look puts sales appeal in your product. Functional . . . the diamond truss pattern adds strength; permits the free passage of sound, heat and air. Made of sheet steel, which is slit and stretched from one to ten times its original width, expanded metal is up to 80% lighter than solid sheet of the same dimensions. And, cost is moderate.

Penmetal expanded metal comes in carbon steel, aluminum, stainless steel, Monel, Inconel, etc. Large or small mesh. Light or heavy gauge.

Next time you're planning a new product, or boosting an old one, don't overlook expanded metal. It offers a world of possibilities for exciting design. Send for descriptive catalog 509-EM.

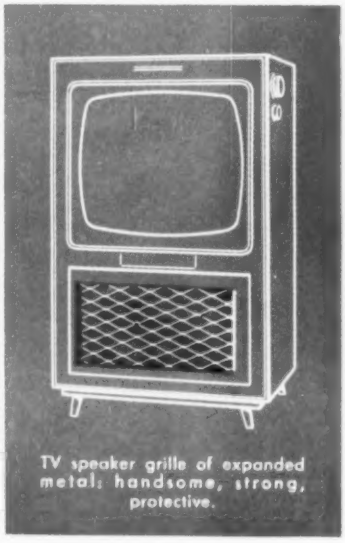
PENN METAL COMPANY, INC.

General Sales Office:
40 Central Street, Boston 9, Mass.

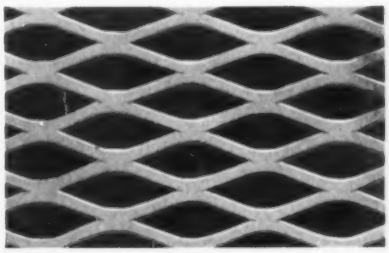
Plant: Parkersburg, W. Va.

District Sales Office: Boston, New York, Philadelphia, Pittsburgh, Detroit, St. Louis, Dallas, Little Rock, Seattle, San Francisco, Los Angeles, Parkersburg

Penmetal expanded metal adds strength with light weight and beauty to gossip bench.



TV speaker grille of expanded metal: handsome, strong, protective.

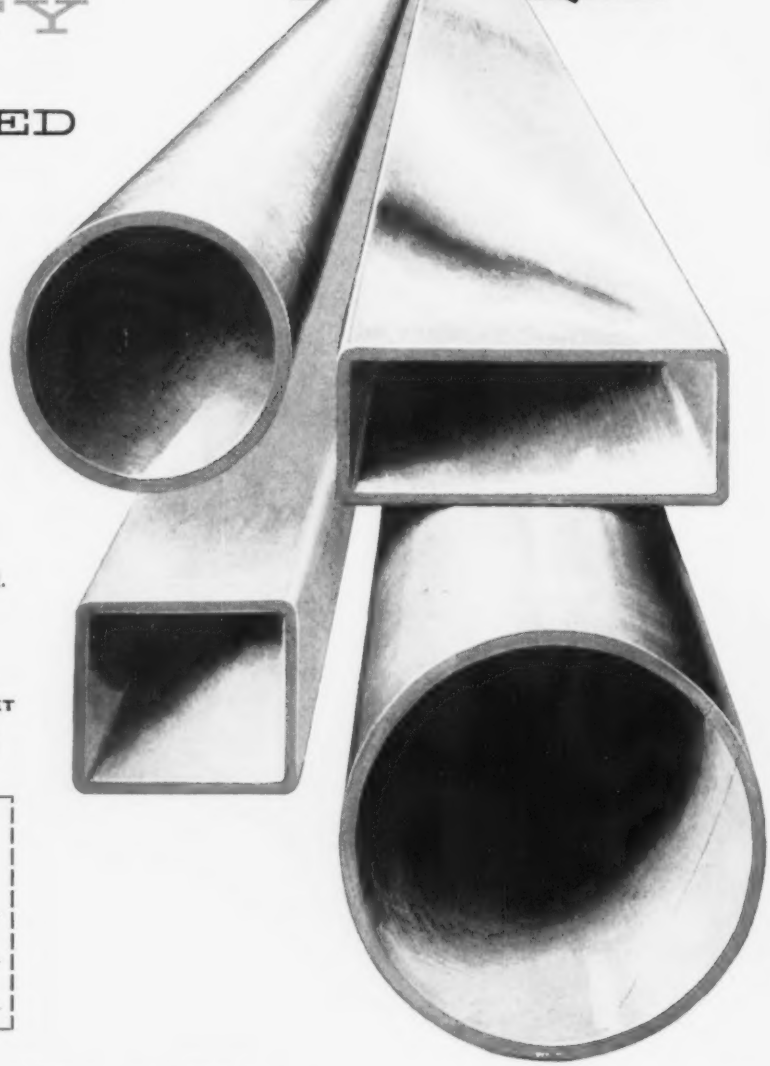


METAL MARK
Penmetal
1869
OF QUALITY

a name to remember

PM-151

IN BRAINARD STEEL TUBING QUALITY IS ASSURED



As a division of Sharon Steel, Brainard can be sure the steel used for the fabrication of tubing has been developed to meet their own exacting standards. From mine to finished product, Brainard Welded Steel Tubing has the extra quality that can come only from an integrated industry.

Brainard Electric Welded Steel Tubing, from ½" to 4" in diameter, is also available in squares, rectangles and many special shapes. Brainard Tubing can be furnished swedged, pressure tested, or fabricated.

For mechanical welded steel tubing of top value, buy Brainard.

SEND FOR THIS BOOKLET
For complete information on Brainard's Mechanical Welded Tubing.

BRAINARD STEEL TUBING
Griswold St., Warren, Ohio

Name _____

Address _____

City _____ Zone ___ State ___

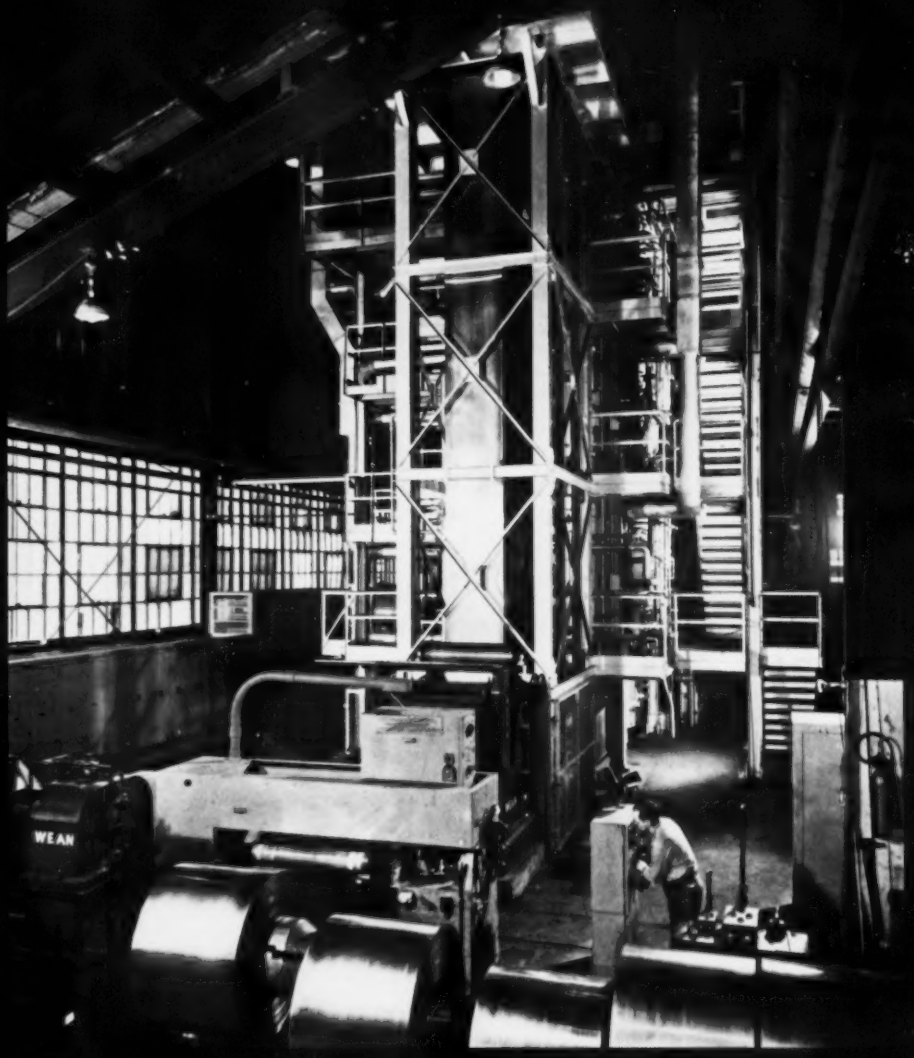
Brainard Steel Tubing

SHARONSTEEL

400

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

Wean, Wheeling and Continuous Annealing



420

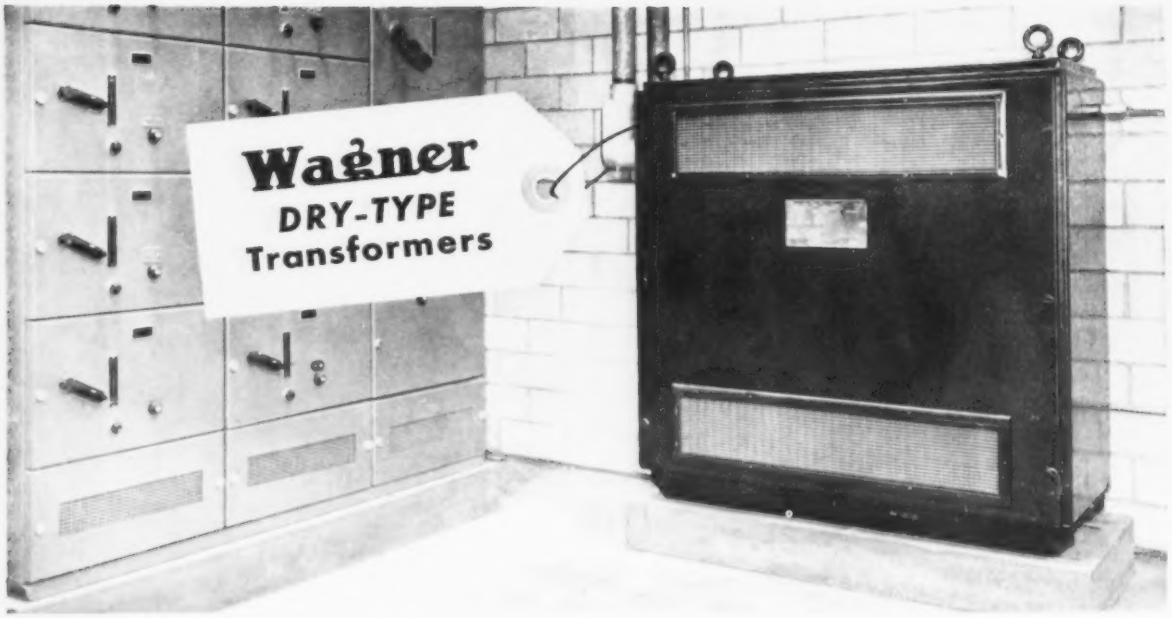
THE continuous strip annealing line above is functional proof of Wean Creative Engineering. Installed in Wheeling Steel's Yorkville (Ohio) plant in 1947, it is still maintaining uniform quality of product at high production rates.

A leading pioneer in the development of the continuous strip annealing process, Wean early realized its outstanding advantages; more uniform anneal . . . better surface uniformity . . . better metallurgical control . . . less cold rolling required for tempering. But perhaps most impressive is the fact that previous methods required thirty-six hours to anneal a 6,000 lb. coil. Today, a Wean Continuous Strip Line anneals the same coil in a matter of minutes.

Nine Wean Continuous Strip Annealing Lines have been built to date. Why not bring this vast experience to bear on your annealing problems.

THE WEAN ENGINEERING COMPANY, INC.

WARREN, OHIO



Put the right voltage where you need it!

NO EXPENSIVE RE-WIRING. Wagner dry-type transformers, when installed close to your machines, portable tools, and lighting circuits, give you the right voltage for use directly from 460 or 600 volt power lines. No re-wiring is necessary — line losses are reduced — installation costs are low.

SAFE TO USE—EVEN IN HAZARDOUS AREAS. You need no fireproof vaults or other protective enclosures, since Wagner dry-type transformers meet all safety requirements for indoor installation. These transformers are liberally designed to carry overloads safely in emergencies.

PROVIDE FLEXIBILITY FOR CHANGING REQUIREMENTS. Dry-type transformers, 3 through 300 kva, are built with Wagner Form W core and coil assemblies. This design permits less weight per kva with correspondingly small cases that are easy to install — easy to move whenever changes in plant facilities are required.

ECONOMICAL TO MAINTAIN. These units have no liquids, valves, gaskets, or gauges to cause maintenance problems. The totally-enclosed types are completely sealed from all contaminating materials by sheet steel cases. Maintenance is reduced to the minimum.

Single-phase, 150 °C Rise. 3 through 50 kva. Silicone insulated, totally-enclosed, non-ventilated. For indoor or outdoor use. 80 °C Rise —15 through 100 kva. For indoor use only.

Three-phase, 80 °C Rise. 9 through 300 kva. Ratings through 30 kva are suitable for indoor or outdoor use. Larger ratings are for indoor use only.

Single-phase, 55 °C Rise. 1, 1½ and 2 kva. For indoor or outdoor use. Bulletin TU-57 gives full information. Write today.

Wagner Electric Corporation
SERVING INDUSTRY SINCE 1891

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

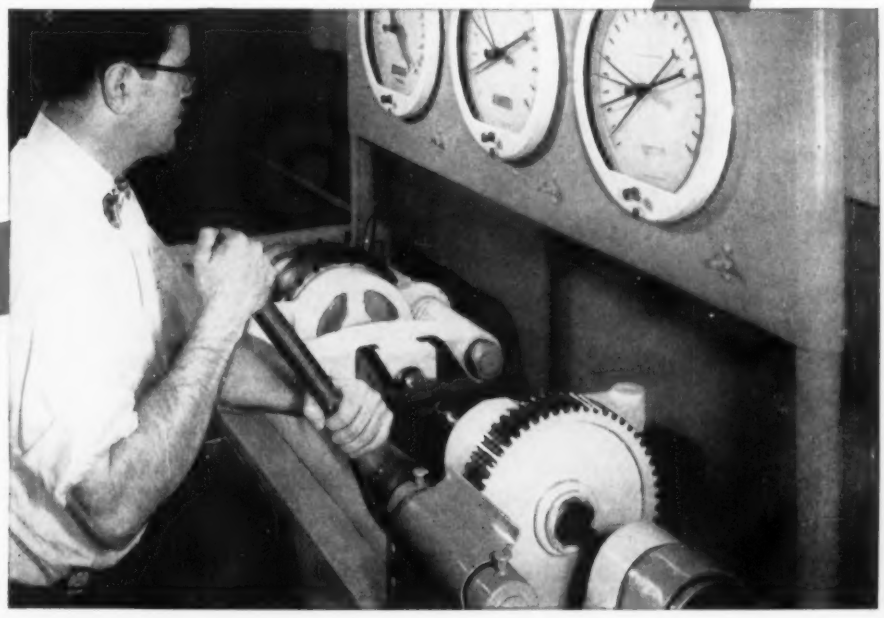
Wagner Electric Corporation
6403 Plymouth Ave., St. Louis 14, Mo., U. S. A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

TO PRODUCE QUALITY
SOCKET SCREWS THE H-K WAY—

OUR LABORATORY CONDUCTS EXHAUSTIVE PHYSICAL AND CHEMICAL TESTS WITH THE MOST MODERN EQUIPMENT

Conventional testing isn't enough . . . we subject H-K screws to rigid tests in our TEN-TOR *machine to determine resistance to both tensile and torque stresses. Because we test the finished screws and not just material, you can be sure every H-K Socket Screw will stand up under the toughest application.*



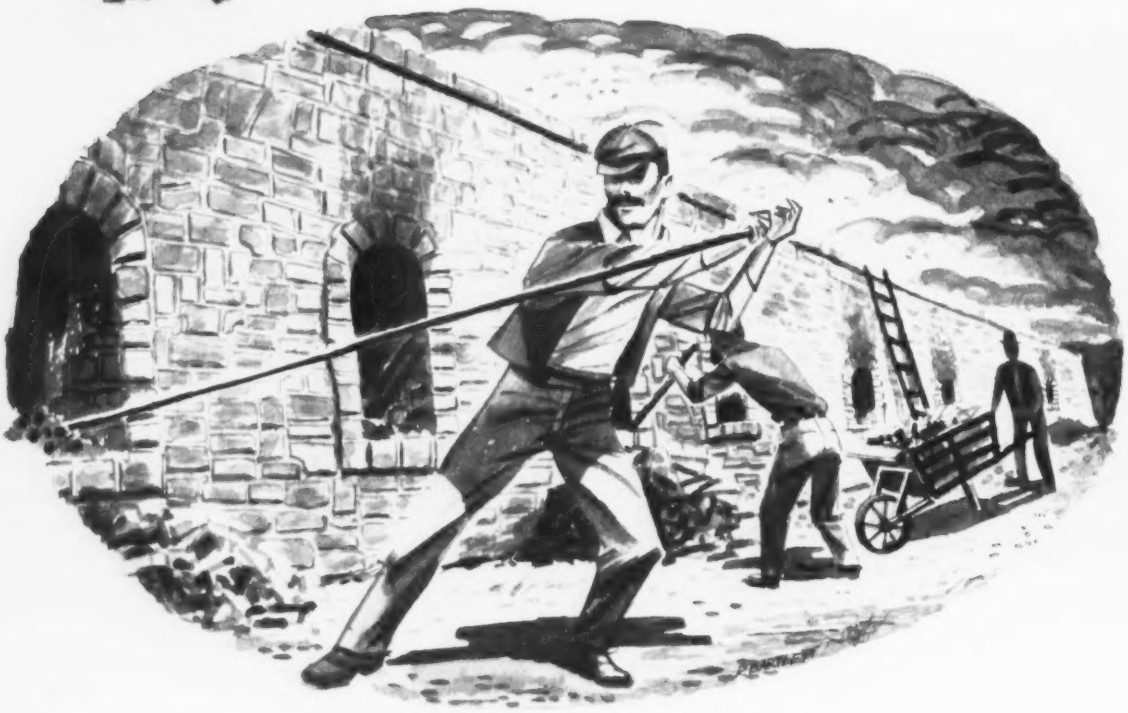
For the finest in socket screw products . . . for unmatched SAME-DAY SERVICE—the name to remember is Holo-Krome. Write for free catalog and technical information.

HOLO-KROME SOCKET SCREWS

THE HOLO-KROME SCREW CORPORATION • HARTFORD 10, CONN.

SOLD ONLY THROUGH AUTHORIZED H-K DISTRIBUTORS

AMERICAN ORIGINALS IN IRON AND STEEL



Helping the iron industry out of the woods

Until as late as 1840, charcoal was the fuel universally used in making iron. Picturesque brick and stone furnaces were, of necessity, confined to the forests, for large quantities of it were needed to keep the furnaces in operation. Some consumed as much as 350 bushels of charcoal to produce a single ton of iron and many of the early ironmakers believed that at least four square miles of woodland should be available for each furnace.

During the first half of the century, important discoveries contributed to fundamental changes in ironmaking which later helped the industry "out of the woods." Early in that period, many experiments were made using anthracite and bituminous coal and mixtures of the former with charcoal.

In 1835, "cooked coal" or coke was first used successfully in this country by William Firmstone of Huntingdon County, Pennsylvania. Later, as the coke process proved increasingly successful, the familiar beehive ovens sprang up by the hundreds, permitting the construction of furnaces at locations more convenient to both markets and raw materials.

Of the many products that are contributing to the progress of the iron and steel industry today, Baker's Magdolite and Jebcolite, the original dead-burned dolomites, are especially identified with economical and efficient production. Through the years, these products have provided increased furnace efficiency and more uniform ingots at lower refractory costs. When you buy, be sure to specify Baker's Magdolite or Jebcolite. Today, they're better five ways; in composition, preparation, strength, economy, and quality.

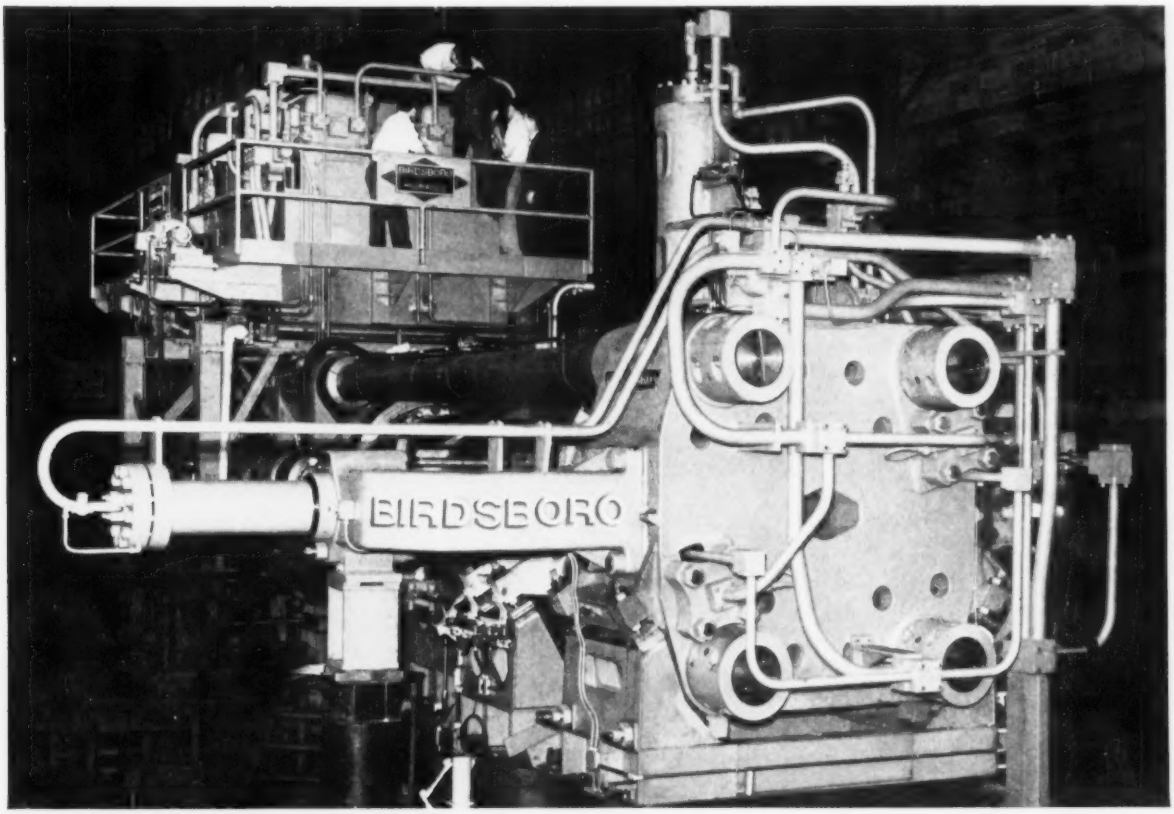
ANOTHER AMERICAN ORIGINAL

JEBCO
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO



MORE revolutionary design features in this new aluminum extrusion press by BIRDSBORO

Again Birdsboro's engineering staff has come up with unique design features for a major aluminum extruder. This time it's an unusually fast acting 3,000-ton oil hydraulic extrusion press that substantially reduces dead cycle time.

No detail has been overlooked by Birdsboro in turning out this advanced unit.

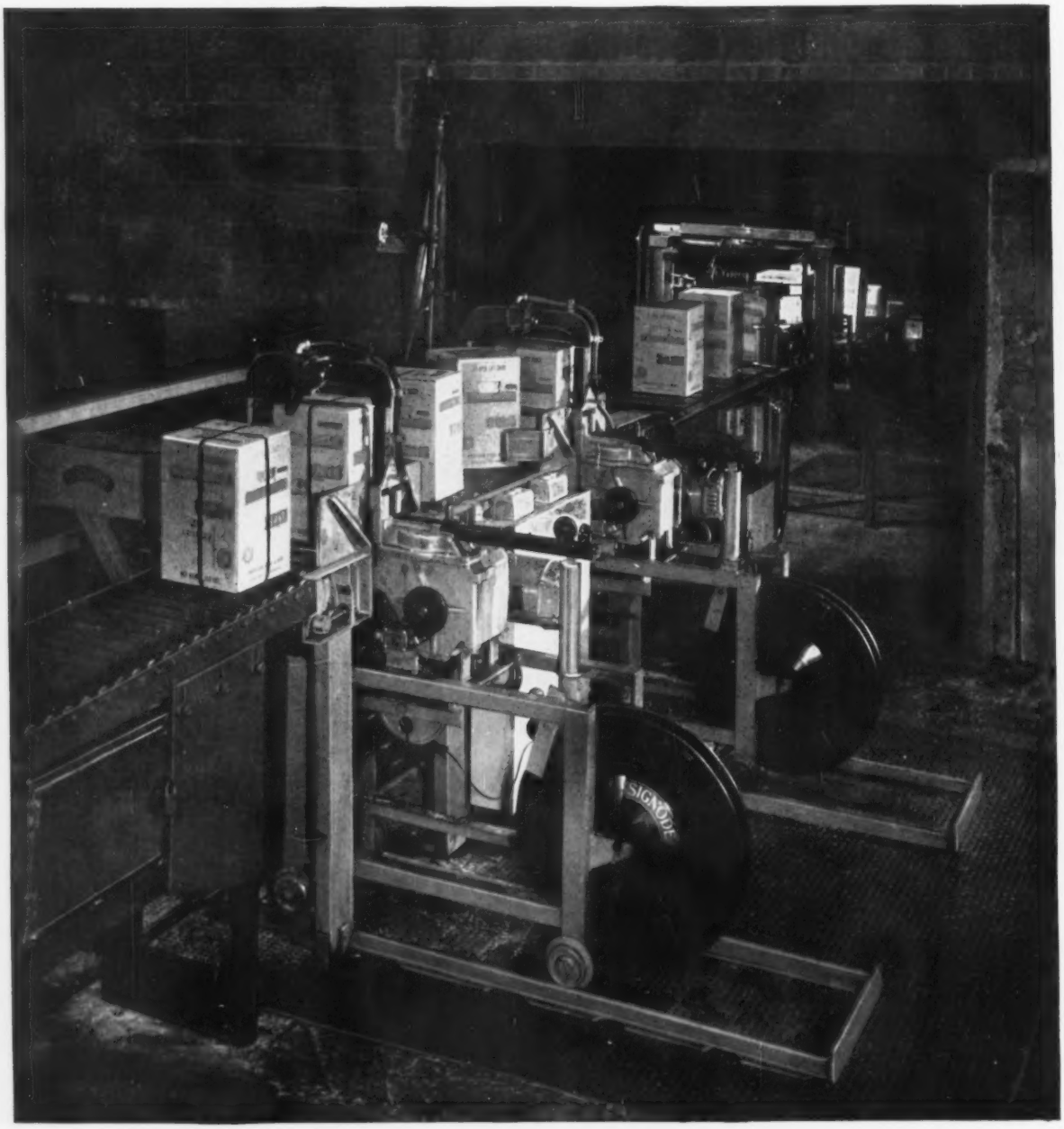
This same imaginative service is yours when you call on Birdsboro to handle your hydraulic press job. For a more comprehensive picture of the Birdsboro staff that can put new future in your operation . . . and *specification data sheets* on the press described here, drop us a line. *Main office and plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa., *Subsidiary:* Engineering Supervision Co., 120 W. 42nd St., New York 36, N.Y.

Check These BIRDSBORO Engineering Innovations:

- ✓ Capable of producing a broad range of aluminum sections and tubing of round, rectangular and irregular shapes.
- ✓ Four electronically-controlled variable-delivery radial piston pumps are driven by two 350 hp motors.
- ✓ The press can operate on 3 pumps while one is being maintained, thus minimizing downtime.
- ✓ Complete flexibility is offered by the variable-delivery pumps and push button controls.
- ✓ Extrusion speed, ranging from 0 to 42" per minute can be regulated from either the main pulpit or from a location overlooking the emerging extrusion.
- ✓ A unique die slide arrangement provides an alternate location for inserting, removing, dressing or adjusting a second die while extrusion continues uninterrupted.

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES (Metalworking and Extrusion) • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



Look! No Hands!

A steady stream of packages get strapped—and nobody's there. These Signode machines do it by themselves. Not all plants are ready for such automation, but these machines are ready and are running in several plants. They are one of many Signode ways to make your product cost less to handle, store, ship and receive. For high strength at low cost, you can't beat steel strapping to hold things together or in place. It will pay you to see your Signode representative. No obligation. Just write:

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-wide.
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

This brake is so large that the bed had to be detachable because of railroad clearance limitations encountered in shipping. It bends 20'-0" x $\frac{1}{2}$" steel plate and is equipped with Steelweld's own tried-and-proven air-operated clutch and brake.

STEELWELD

BUILDS LARGE PRESS BRAKES

Regardless of Size — Small or Large — Steelwelds Have Much to Offer

ALTHOUGH Steelweld Brakes are built in a wide range of sizes, it is in the large classification where Steelweld's many fine features really show up. Brakes used for forming long plates—15, 20, 25 feet—or for working metal thicknesses of $\frac{1}{4}$ inch to $1\frac{1}{2}$ inch, must be quality built to operate day in and day out on a continuous production schedule.

The entire line of Steelwelds is heavily built to withstand hard, rugged service. Steelwelds have all the features that make for fast set up, easy operation, accuracy of work, high output and simple infrequent maintenance.

We urge you to get the facts on these fine, quality-built machines.

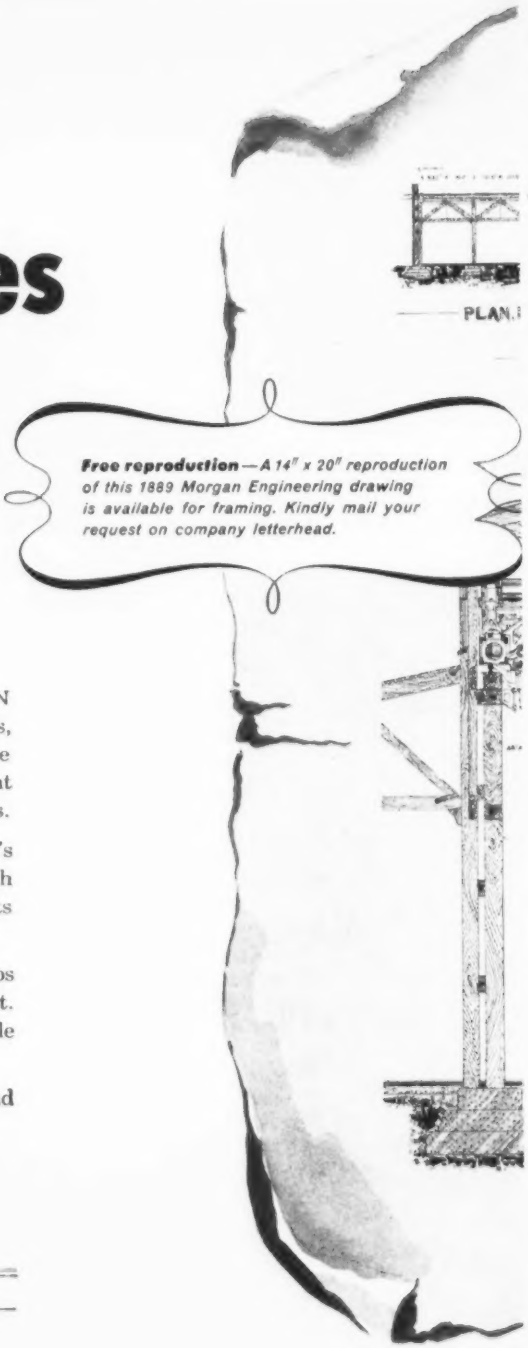
STEELWELD
PRESS BRAKES

Write for free copy of Catalog No. 2010

STEELWELD DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4866 E. 281 ST. • WICKLIFFE, OHIO

For bonus power, speed and dependability

Morgan cranes and mill equipment



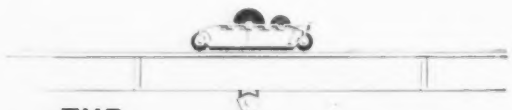
Free reproduction—*A 14" x 20" reproduction of this 1889 Morgan Engineering drawing is available for framing. Kindly mail your request on company letterhead.*

Look back—Remember how often you have seen the name MORGAN on cranes, charging machines, blooming and slabbing mills, shears, saws and auxiliary mill machinery? Wherever great weights must be lifted or big blocks of metal are worked, you find Morgan equipment . . . at the the key spots in maintaining continuous-flow operations.

Inventive engineering and 89 years of close contact with industry's needs have resulted in greater speed, capacity and efficiency with Morgan-built products . . . lower operating and maintenance costs . . . absolute dependability.

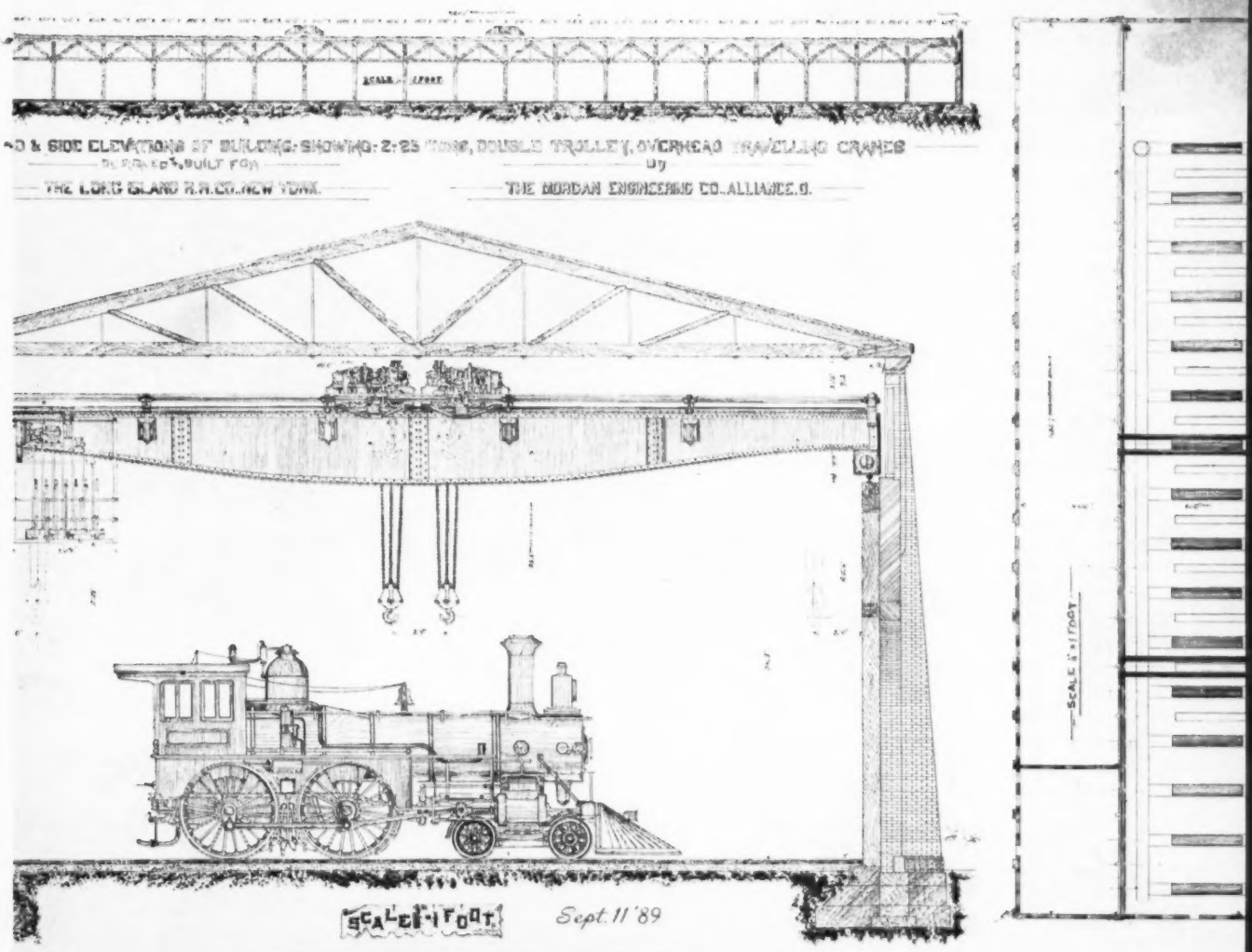
Look ahead—When you buy equipment to handle the big tough jobs year after year, savings cannot be measured in terms of initial cost. They must be measured in terms of uninterrupted, more profitable production.

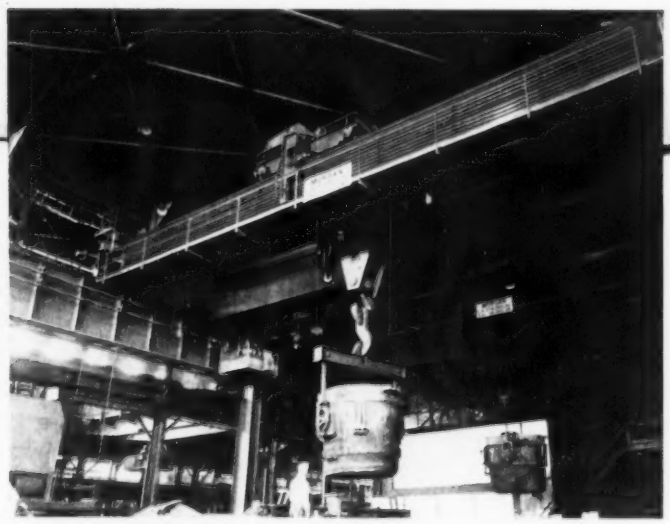
Let our representative help you plan to speed production and lower costs with Morgan cranes and mill equipment.



THE **MORGAN** ENGINEERING CO. *Alliance, Ohio*

Overhead electric traveling cranes, gantry cranes, open hearth special cranes, plate mills, blooming mills, structural mills, shears, saws and auxiliary equipment.





Today—*These 70-foot span Morgan cranes speed foundry operations. Each crane has a 125-ton main hoist and a 25-ton auxiliary hoist.*

Allis-Chalmers announces... **Newly**

1

Gang-operated disconnect switch isolates starter from incoming power — assures safe entry of high voltage compartments.

2

Steel cubicle is compartmentalized — separates high and low voltage equipment.

3

Short-circuit protection is provided by fast-acting current-limiting fuses, rated 150,000 kva at 2300 volts and 250,000 kva at 4160 or 4600 volts.

4

Overload protection is handled by accurate relays which trip only on excessive motor current, preventing needless motor stoppages.

5

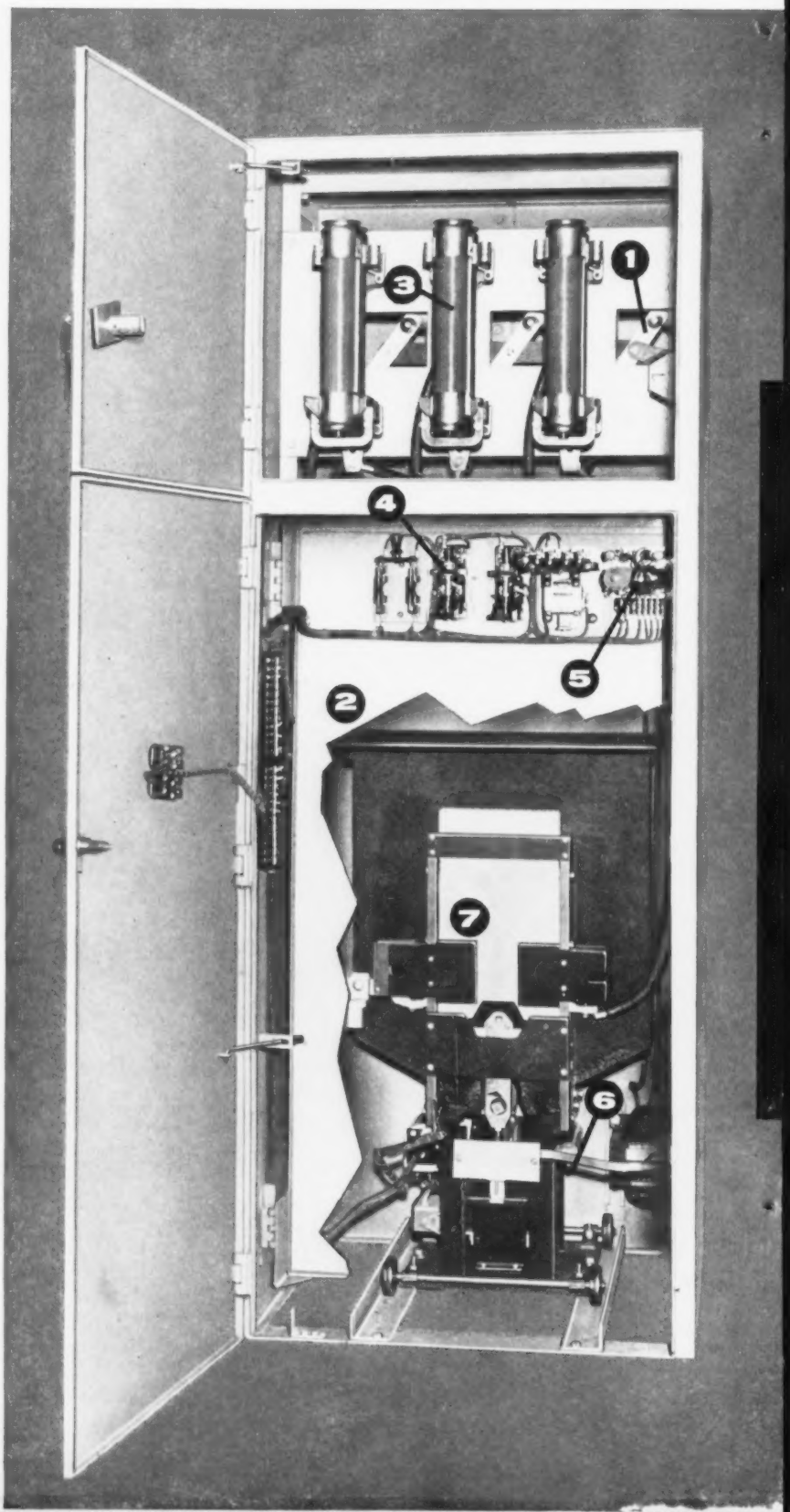
Undervoltage protection instantaneously opens line contactor on loss of voltage. Time-delay undervoltage protection also available.

6

Mechanical interlock coordinates contactor, disconnect switch, upper door and inner control barrier for maximum safety.

7

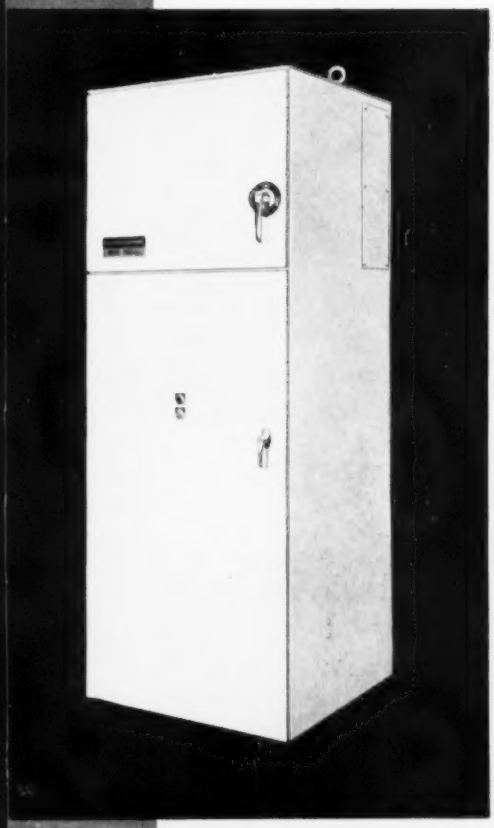
Roll-out contactor makes maintenance easy—even in narrowest aisle space. (Routine inspection and maintenance can be done with contactor in place.)



Designed

Type H High Voltage Motor Control

Combines front access with space economy...

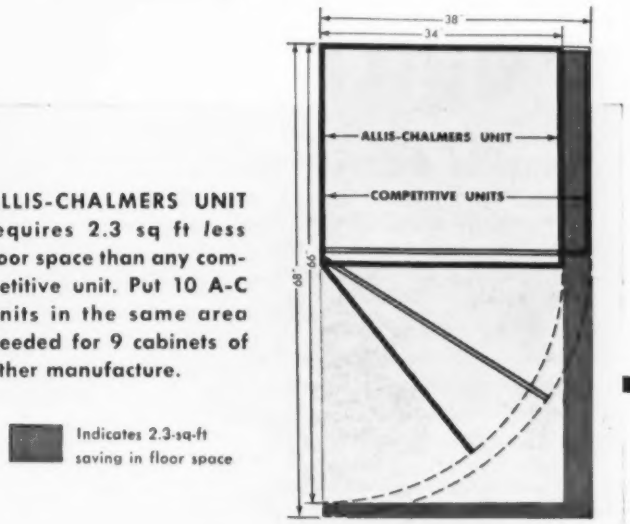


In addition, you get maximum protection for personnel and machines, thoroughly tested components, and ample panel space for modifications. It's all built into the *smaller cabinet* of a newly designed line of Type H high voltage starters from Allis-Chalmers.

Here is control that couples compactness with roominess (for ease of maintenance) . . . here is a starter that joins test-proven performance with versatility (for addition of meters and relays) — AND the line meets every 2300 to 5000-volt motor need.

For more information on this engineering advance, contact your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS UNIT requires 2.3 sq ft *less* floor space than any competitive unit. Put 10 A-C units in the same area needed for 9 cabinets of other manufacture.



Indicates 2.3-sq-ft saving in floor space

ALLIS-CHALMERS

A-5517

QUICK DELIVERY

Special fasteners to your requirements

Ferry Cap fills rush requests for custom-made threaded fasteners. That's been our business for 50 years.

To render even better service we will, if desired, "sit in" and help plan fasteners at the time products are designed.

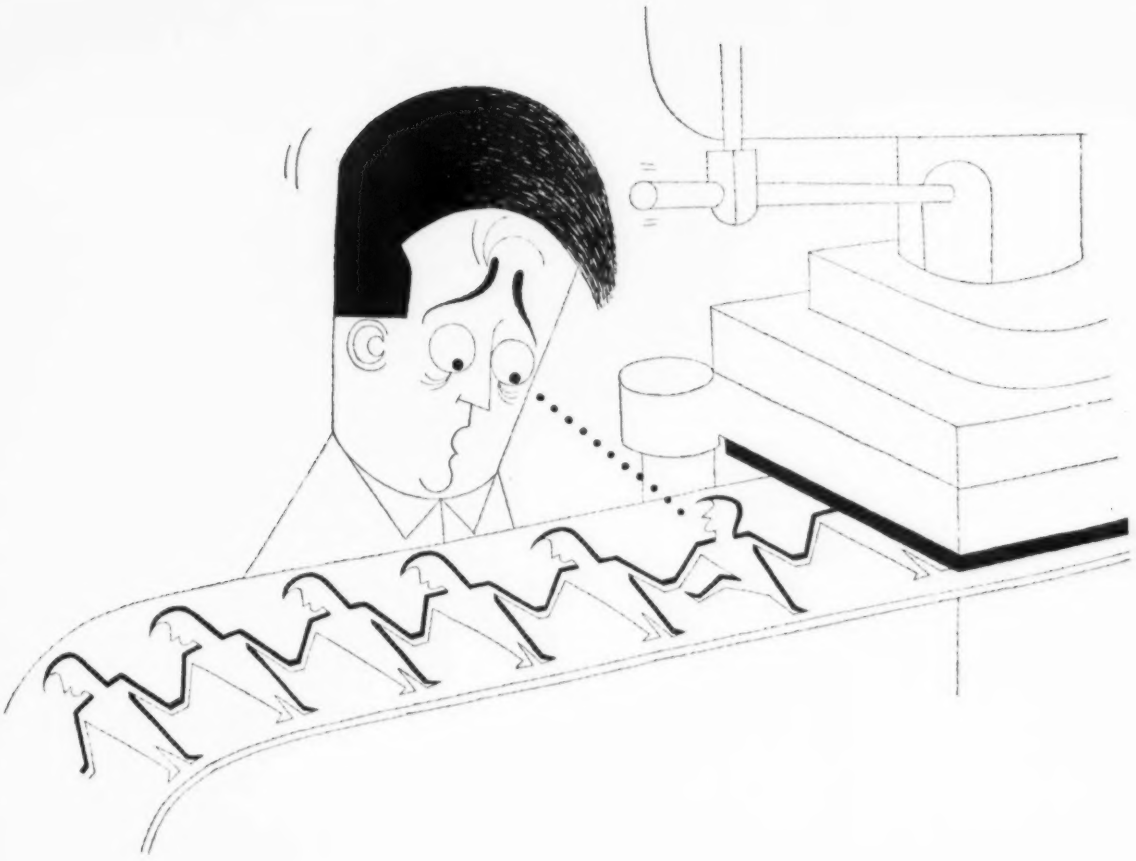
Even if you don't anticipate a fastener problem, we'll be happy to look over your preliminary drawings—frequently we can suggest fasteners that will cut costs and assembly time. You can count on Ferry Cap, so call on Ferry Cap *TODAY!*

THE FERRY CAP & SET SCREW COMPANY

Makers of the famous Countr-Bor® Screw for socket head applications.

2157 SCRANTON ROAD • CLEVELAND 13, OHIO

FERRY CAP *is geared to FASTER SERVICE*



Got a metal blanking problem?

Perhaps you need dies with the machinability and abrasion-resistance of Crucible's **AIRDI 150-S** tool steel—available from local warehouse stocks.

THE PROBLEM: You need dies that are easy to machine yet abrasion-resistant for the jobs in your shop. If you can get a die steel with both qualities, you'll increase production between refinishes. So you call your Crucible warehouse—

THEY RECOMMEND: Airdi 150-S, an air or oil hardening tool steel that machines 25 to 30% easier than older D2 types. This free-machining, high carbon high chromium steel has the strength and toughness to resist pounding and wear—die qualities you need for long, high-production operations. Try it! You'll also find this general-purpose steel suitable for most other types of dies, and for punches and gauges.

Crucible Airdi 150-S is only one of the dozens of special-purpose steels stocked at local Crucible warehouses, ready for prompt delivery in the sizes and shapes you need. Remember: Crucible is the only specialty steel producer *fully integrated to the point of use*. That means control and responsibility from raw material to warehouse delivery to you.

STOCKS MAINTAINED OF:

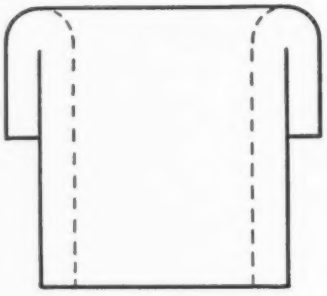
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

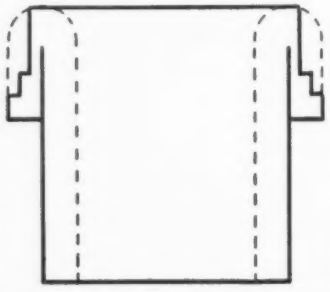
Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

more proof of *Carpenter* quality . . . at no extra cost



Reverse bend **is made on one end, doubling the pipe back on itself.**



Machining **is then performed on the doubled back part of the pipe as shown in photo.**

Carpenter Stainless Pipe shows fabrication savings!

Only the highest quality stainless pipe and tubing with outstanding uniformity in properties and dimensions can take this punishing reverse bend (see sketches) and succeeding machining operations. The part is made from 2″ Carpenter Schedule 40 pipe, and must meet close tolerance requirements consistently.

If more of this kind of proof is needed, call your nearest Carpenter Distributor today. He has the service and stock to serve you right!

MEMBER

The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

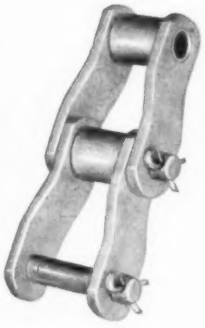
Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

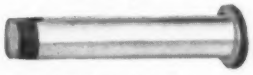
Stainless Tubing & Pipe

"Stress raisers" eliminated by Link-Belt LXS chain design

LXS "FULL-ROUND" DESIGN



"Full-round" pitch holes . . . . no sharp corners



"Full-round" pin

"Full-round" bushing

"FULL-ROUND" DESIGN eliminates stress concentration points. Heat treatment of all parts adds even greater strength and extra wear life to selected steels. Accurate control of these processes avoids brittleness, poor wear values and low tensile strengths . . . and assures uniformity.

Large pins, bushings mean ample live bearing area for long life

For long life under severe conveyor and drive conditions, Link-Belt LXS chain provides extra strength, increased wear resistance and wider application flexibility. This fabricated steel roller chain incorporates many advanced design and manufacturing refinements, resulting in superior ruggedness and accuracy.

Eliminate weak points

"Full-round" design does away with stress concentration points most frequently subject to failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly, increasing chain life.

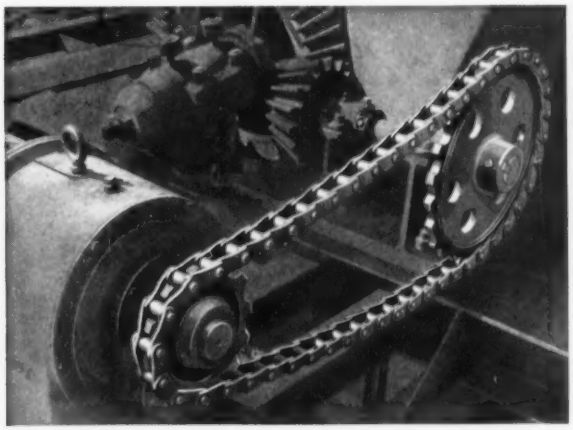
Pins and bushings are accurately sized for controlled press fit, preventing rotation in sidebars. Made from selected bar steel, sidebars are carefully machined for proper pitch hole size and for maintaining firm, tight press fit of pins and bushings. This assures close control of pitch and proper chain length after assembly.

Hardening extends life

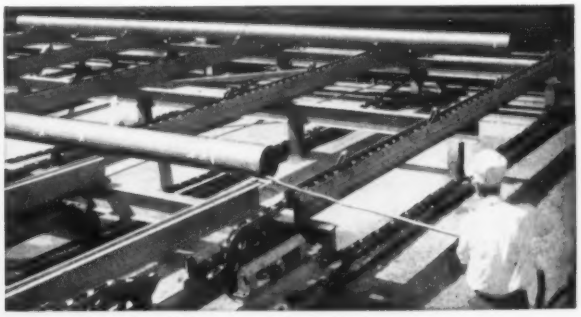
Another Link-Belt long-life extra is the controlled hardening of selected steels used in the manufacture of LXS chain. Pins, for example, are made from a tough steel, specially treated for high strength in shear and for maximum wear value. Bushings are properly hardened to shrug off shock and resist wear.

Rollers are accurately machined to assure proper operating clearances and free-rolling action. Controlled hardening gives them the necessary resiliency and durability.

LXS especially popular for exposed drives, high impacts



Link-Belt LXS chain is the long-life answer for exposed drives, abrasive and high-impact conditions. Its large, live bearing area reduces cutting action of abrasives because load is spread over a broad area.



LXS chain provides extra strength, wear-life for heavy-duty conveying

Link-Belt LXS chain has real stamina—as shown in this conveyor application for handling 1000-pound, 40-foot lengths of steel pipe. Thanks to accuracy of pitch and attachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life for the extra-long conveyors so popular in today's move to mechanization.

HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,257

REDESIGNED HEADSTOCK is massive, rigid casting, eliminating vibration and assuring maximum accuracy. Electric combination clutch and brake permits fast, smooth starts and stops without overheating. The Gisholt main control (manually or hydraulically operated) and the simple push buttons and feed-stop valves speed changeovers. A wide range of spindle speeds permits peak machining efficiency on all materials.

GISHOLT JETracer (mounted in place of standard front carriage) for either single or multiple pass work. For latter, JETracer will make up to four consecutive, automatic passes from four templates of different lengths and patterns. **Standard rear independent slide** can operate any time within the general machine cycle to complete the part. **Air- or hydraulically-operated tailstock** can be easily mounted, positioned or removed.

High capacity + flexibility = economy

ISN'T THIS WHAT YOU WANT

CONSIDER WHAT YOU CAN DO with this new Gisholt MASTERLINE No. 12 Automatic Production Lathe:

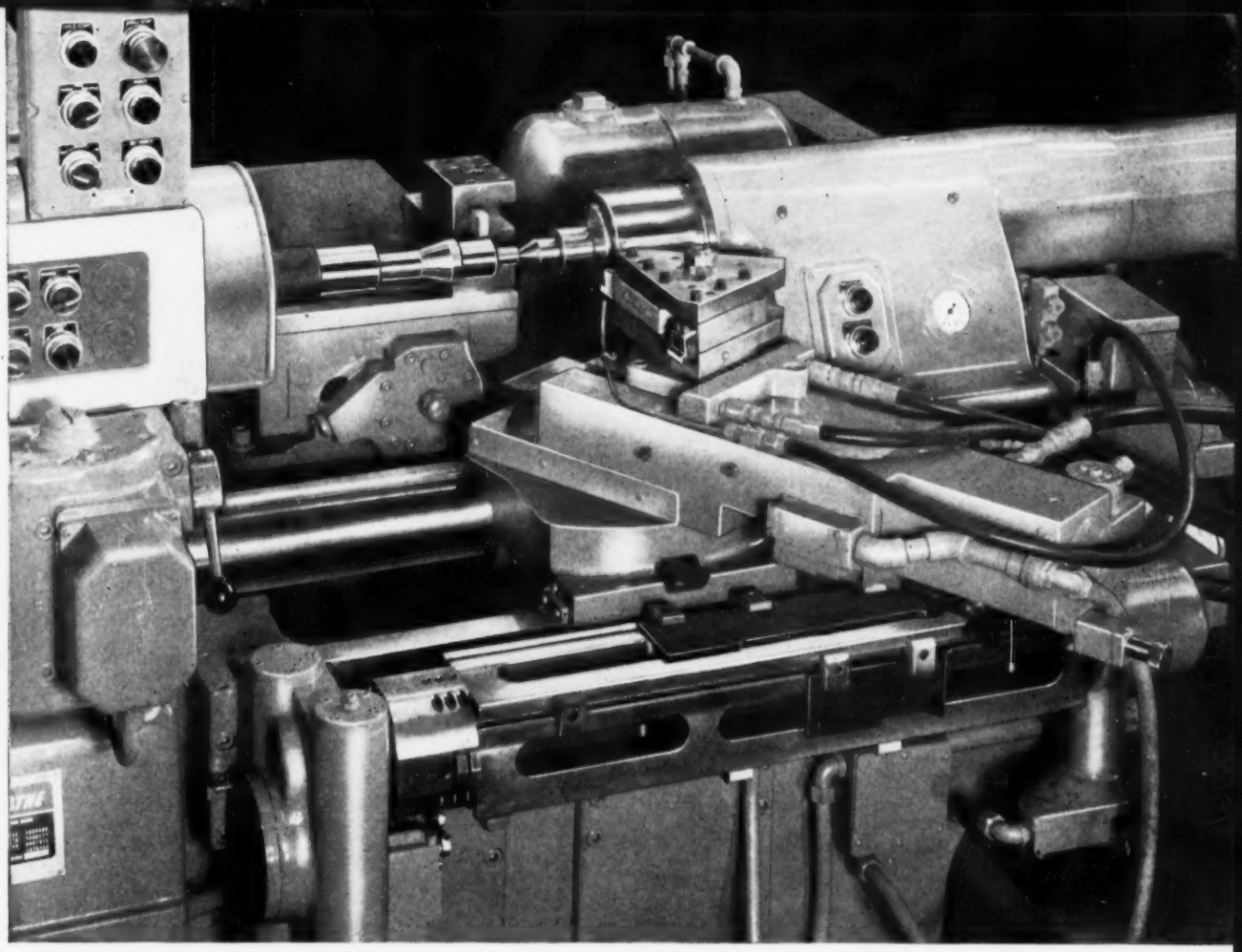
Here is an automatic lathe designed specifically for high production operations—yet this machine is flexible enough to handle a variety of similar parts in small repeat lots.

You can hold work in a chuck or fixture—with a work driver and tailstock—on an arbor or between centers. To start the automatic cycle, your operator simply loads the part, chucks it and raises the Main Control Lever. He is then free to handle additional machines—or to perform other work—until the part is completed.

On the Gisholt No. 12 Automatic, all carriage and slide movements are hydraulically actuated. The front carriage has both longitudinal and transverse motion—or a combination of the two—with quick approach, automatic tool relief and rapid return. You can mount the rear independent slide at any angle to machine bevel gears, drill cones, or handle other parts with angular surfaces.

For special jobs—like machining both ends simultaneously on small motor frames, cylinder sleeves,

MASTERLINE
GISHOLT SINCE 1887
GISHOLT



IN AN AUTOMATIC LATHE?

or similar parts— you get even greater flexibility from the No. 12 through auxiliary slides, operated by movement of the standard slides. Or you can mount a back facing attachment within the spindle—for still another way to machine a maximum number of surfaces in one chucking. And for outstanding versatility with great savings in tool and setup costs, the front carriage on the No. 12 may be replaced by a single- or four-pass JETracer slide.

For complete details of the new features on the Gisholt MASTERLINE No. 12 Automatic Production Lathe, call your Gisholt Representative.

WRITE GISHOLT TODAY for advance data on the new Gisholt MASTERLINE No. 12 Automatic Production Lathe. Ask for Form 1178.

GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin, U.S.A.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • PACKAGING MACHINES • MOLDED FIBERGLAS PLASTICS

Tighter Coils For Better Springs

Co-owners Walter Pesaresi (left) and James Berg of Winamac Coil Spring examine coil of Pittsburgh Steel Oil Tempered Wire and a stock of coiled springs, ready for shipment.

Pittsburgh Steel's O. T. Wire Does Job For Winamac Coil Spring

When a spring-coiling job comes along so tough that many spring-makers dodge it, a satisfactory spring usually depends on combining human know-how with the right kind of quality steel wire.

A balance spring that supports the mower on a farm mowing machine presented such a problem recently to the Winamac Coil Spring Company in Winamac, Ind.

This is the story of how one man's knowledge of wire and spring-making produced a more than satisfactory spring on a difficult job.

The $16^{9}/_{16}$ inch long spring, coiled exceptionally tight and made of Pittsburgh Steel Company's Oil Tempered Wire, has 30 coils. Two and one-half coils at each end are passive. They hold a plug inserted by the farm implement manufacturer who buys the springs which support the weight of the mower on the tractor.

Springs often were rejected because of improper initial tension and burrs which interfered with insertion of plug ends.

Walter Pesaresi, co-owner and co-founder of Winamac Coil Spring Co. and a spring-maker all his life, credits three factors for his success in coiling the springs properly.

1. Selection of Pittsburgh Steel's Oil Tempered Wire.

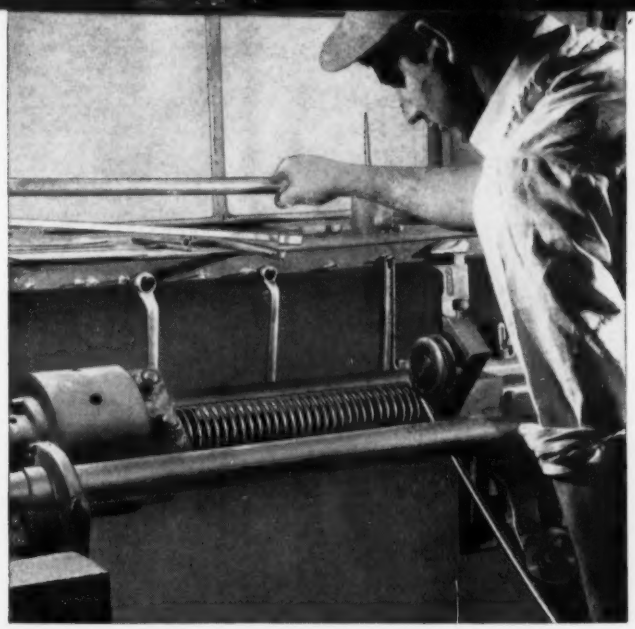
2. Development of a new device which permitted tighter coiling.

3. Proper heat-treating techniques for stress-relieving the steel after coiling.

• **The Right Wire**—"Pittsburgh Steel's Oil Tempered Wire was a happy choice," said Mr. Pesaresi. "Its grain structure is right, it has a good surface, it's free from hard or soft spots and we can depend on it to hold uniformly to tensile strength specs."

• **Coiling Techniques**—Although Winamac Coil Spring has a hand-coiler matched by only three or four others in the country, Mr. Pesaresi found special techniques were needed to produce the balance spring with tight enough coils. To solve that problem, he designed and built a carriage and rollers that ride along the frame of the machine and guide wire on the mandrel. This device forces the wire being coiled tight against the wire just coiled. Exceptionally tight coils result.

• **Heat Treatment**—Coiling 21 feet



Balance spring is coiled on hand machine. It is equipped with a special carriage, designed and made at Winamac Coil Spring, which assures tight coiling.

Winamac uses other Pittsburgh wire than oil tempered. Here are tiny springs, made from music wire, for use in valves of Air Force oxygen masks.

Co-owner Walter Pesaresi examines finished balance spring, complete with plug which is inserted by customer who uses spring to support farm mower on tractor.

of .531 oil tempered wire into a 30-coil spring $16\frac{9}{16}$ inches long produces heavy stress in the wire.

That's why stress-relieving is necessary to impart exactly the proper physical characteristics.

In the mowing machine spring, stress relief is especially important. The spring is subjected to continuous flexing and must be capable of supporting widely varying shock loads throughout its full range of adjustments.

After study and experimentation, Mr. Pesaresi found stress relieving coiled springs for $2\frac{1}{2}$ hours at 500 degrees Fahrenheit provided just the right combination of time and temperature to give the springs long life in service.

• **Dependability**—Winamac Coil Spring has come to depend on Pittsburgh Steel for more than oil tempered wire.

Winamac uses music wire, supplied by the Johnson Steel & Wire Company subsidiary in Worcester, Mass., for automotive springs, appliance applications and for such uses as a valve spring for an Air Force oxygen mask. (Photo at left.)

"We found from actual experience," said Mr. Pesaresi, "that Johnson music wire was the only wire that held its dimensions uniformly."

Whether your operations call for oil tempered wire, some other type of manufacturers wire, or a fine wire specialty like Johnson's music wire, you'll find what you want at Pittsburgh Steel.

The fine, consistent quality of Pittsburgh wire holds down your production costs and builds customer satisfaction.

Trained Pittsburgh Steel engineers are readily available with counsel and wire know-how that will help solve your problems. You can get that help today by calling any of the Pittsburgh Steel district offices listed below.

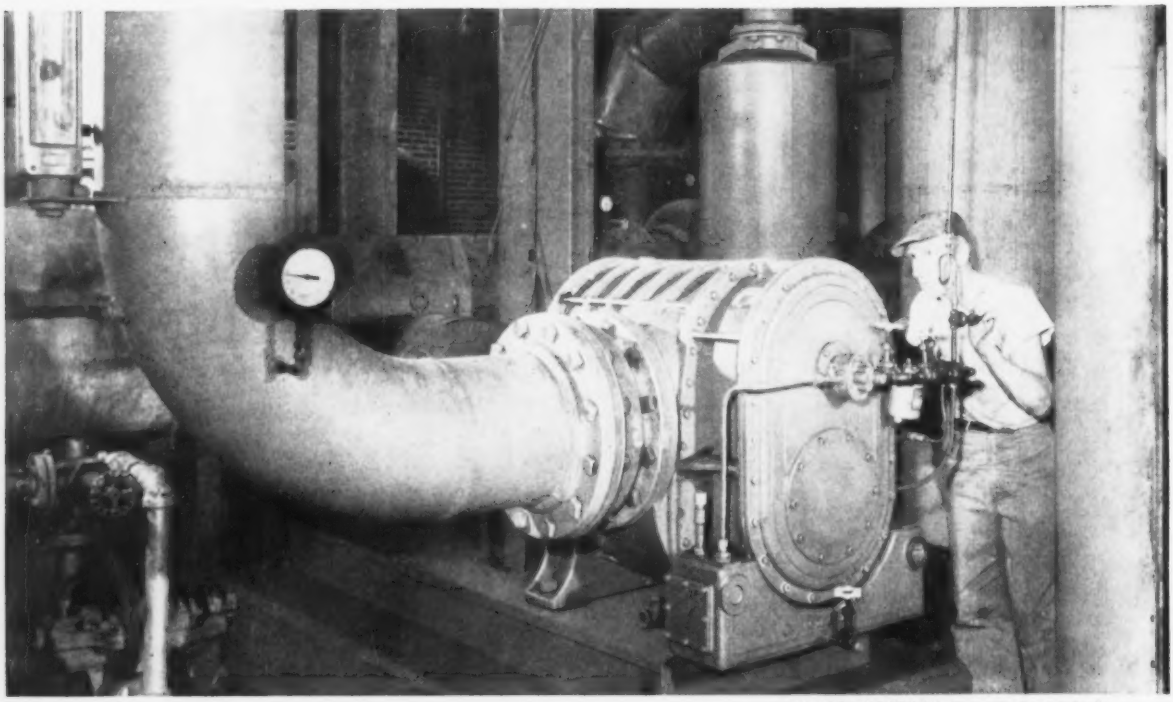
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

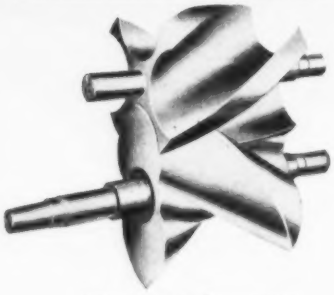
Most compact compressor of its type . . .



AXI-COMPRESSOR in an industrial plant

Use the Axi-compressor*

for pressure and vacuum . . . for air, gases, vapors



Rotors of Axi-Compressor

If you are looking for a compact, efficient source of pressure or vacuum, investigate AXI-COMPRESSORS: they provide greater output per pound of unit. AXI-COMPRESSORS may be operated efficiently over a wide range, with low power consumption.

Rotors are of cycloidal form, screw type. They operate with clearances of a few thousands of an inch, but never touch . . . there's no need for internal lubrication.

Operating advantages of this axial-flow, positive-displacement unit includes the following:

1. Compact, rugged construction
2. Smooth, shockless flow
3. No metal-to-metal contact in compression chamber
4. Operating speeds that permit direct-connected drivers in many cases
5. Oil-free delivery
6. Good efficiency over wide range

For complete information on the AXI-COMPRESSOR line for pressures from 25-inch vacuum to 15 psi, capacities from 100 cfm to 15,000 cfm . . . contact your Ingersoll-Rand compressor specialist. Performance curves available in Bulletin 11,001 . . . write for it.

*Axi-compressor
. . . formerly "Standardaire"

17-663

Ingersoll-Rand
11 Broadway, New York 4, N. Y.

PUMPS • CENTRIFUGAL & RECIPROCATING COMPRESSORS • DIESEL ENGINES • AIR & ELECTRIC TOOLS • TURBO BLOWERS • STEAM CONDENSERS

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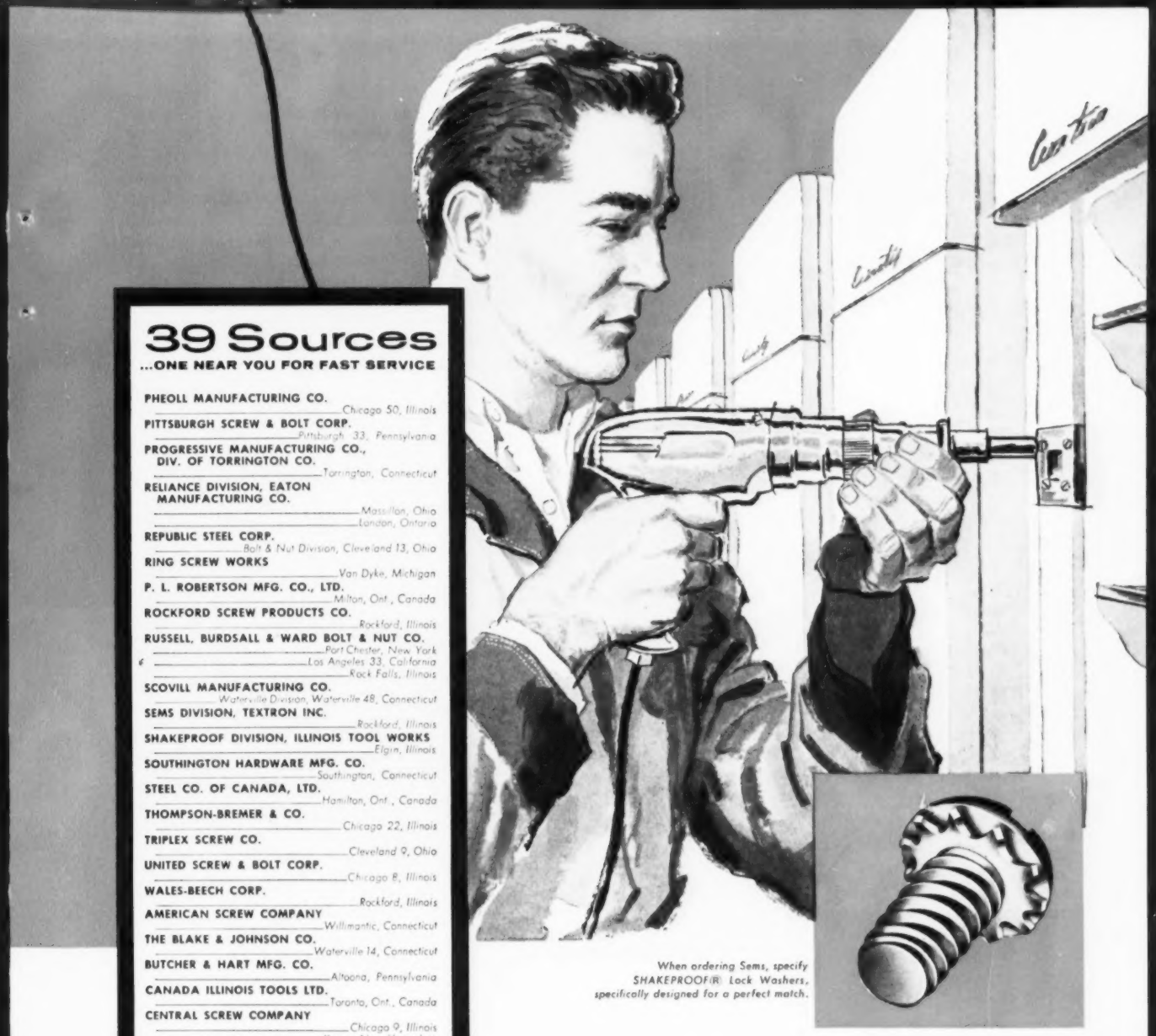

When ordering Sems, specify SHAKEPROOF® Lock Washers, specifically designed for a perfect match.

pre-assembly...

reduces handling...saves time and money

Sems fasteners are pre-assembled to cut wasteful hand operations in mass-assembly production. Washers can't be lost or forgotten and rejects due to mismatched screw and washer are stopped. Often hopper-fed for automatic driving, pre-assembled Sems are a first step in automation.

Sems

SEMS is a development of Illinois Tool Works, Chicago

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the ***Extra Value*** *behind Every* ***SIMONDS Segmental Saw!***

Sure you get straighter cutting, smoother finish and greater satisfaction when you select Simonds Segmental Saws — with your choice of tongued or slotted segments. But you get a lot more!

You get fast, dependable service at Simonds Factory Branches from skilled Simonds servicemen who really know their business.

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In Repairing — Specially designed equipment handles flattening, straightening, tensioning, riveting, and finish grinding.

In Re-segmenting — Specialists using the latest techniques and machines have the know-how to do any re-segmenting job quickly to your complete satisfaction.

For complete Segmental Saw Service send your saws to any of these Simonds Factory Branches: 1350 Columbia Road, Boston, Mass. • 3323 West Addison St., Chicago, Ill. • 228 First St., San Francisco, Calif. • 6500 N.E. Halsey St., Portland, Oregon.

NOTE: Simonds Segmental Saws (either tongued or slotted type) are made of tough shock-resistant alloy steel saw plate with accurately fitted High Speed Steel toothed segments securely riveted to the rim. Saws are also available with carbide tipped segments for cutting aluminum and magnesium.

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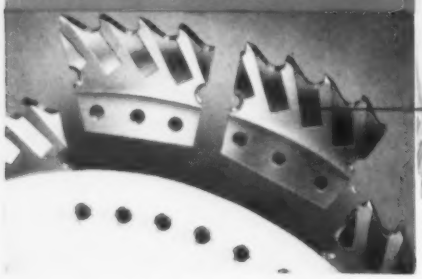
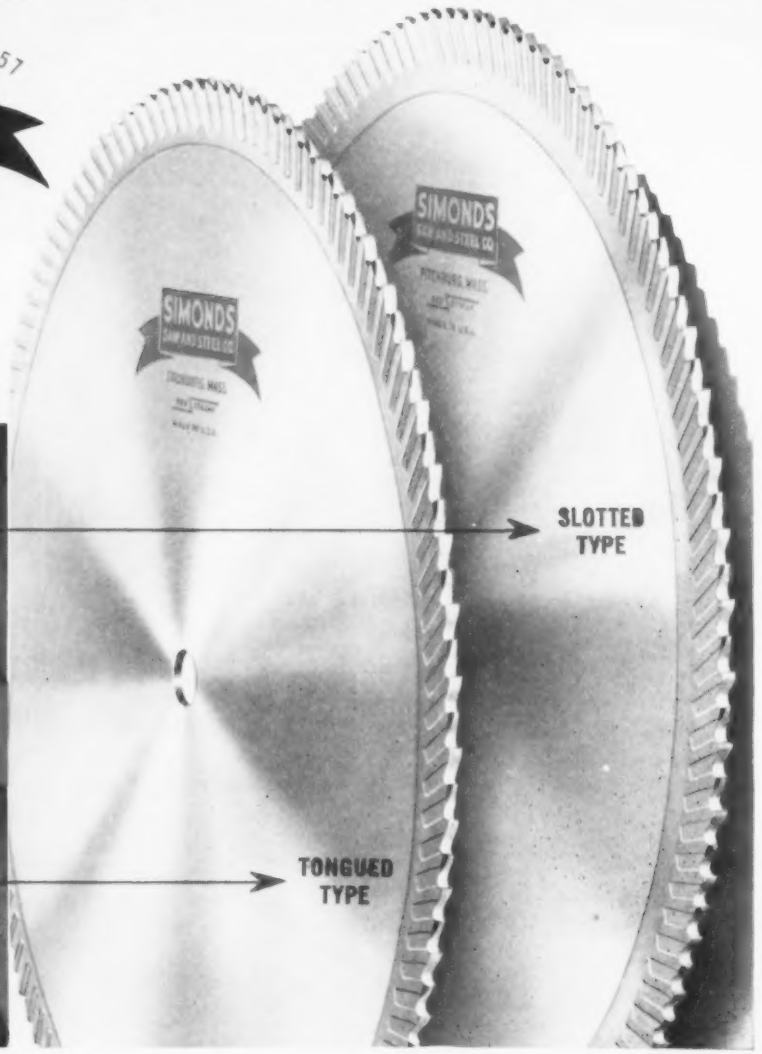
FITCHBURG, MASS.

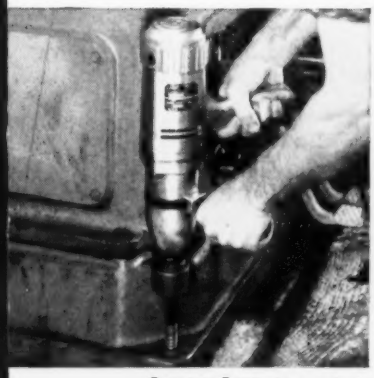
SIMONDS SERVICE INCLUDES
SHARPENING, RE-SEGMENTING AND REPAIRING
BOTH TYPES





Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon, Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

New B&D No. 300 Impact Wrench slashes maintenance down-time!

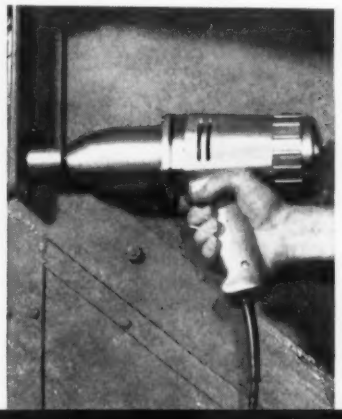


LONGER LIFE: torque tests show it has higher performance, cooler running, longer life than any other.

MORE POWER PER POUND: this light-weight (only 13.5 lbs.) tool really packs a powerful punch!

EASIER HANDLING: no nose or tail heaviness. No starting torque twist. All-position auxiliary handle.

NO. 100 IMPACT WRENCH: the rugged wrench for smaller applications; hits max. torque in 6 seconds!



Mail coupon today for free demonstration!

Now, Black & Decker takes the back-break out of moving equipment, installing new tools, making structural changes and many other like jobs! The new No. 300 Heavy-Duty Impact Wrench brings a minimum of 300 ft. lbs. of torque to bear—removes rust encrusted bolts as slick as a whistle—bangs home bolts as big as 1¼" effortlessly. The powerful No. 300 does the work—not the operator!

Look about you! Chances are you'll see many applications for this great, new, super-powered Impact Wrench—the tool that sets and removes bolts faster; saves you time and money. Then, mail the coupon for a free demonstration. A Black & Decker distributor will be happy to show you—in your own plant, on your own equipment—just how much the new B&D No. 300 Impact Wrench can slash *your* maintenance down-time! THE BLACK & DECKER MFG. CO., Dept. 0910, Towson 4, Md. (In Canada: P.O. Box 278, Brockville, Ont.)

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Quality Electric Tools—Power-Built for powerful performance

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34,500 Lockheed Employees Regularly Buy U.S. Savings Bonds

"We in the Lockheed Aircraft Corporation family are proud of our record of participation in the U.S. Treasury's Payroll Savings Plan.

"It is important . . . particularly in these times . . . for all Americans to support our nation's programs and policies in every way. I know of no better way than the regular purchase of Savings Bonds.

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"Each of our new employees is given the opportunity to join his fellow workers in the Payroll Savings Plan. We feel this is an important step in insuring America's future security and prosperity."

ROBERT E. GROSS, ***Chief Executive Officer, Chairman of the Board, Lockheed Aircraft Corporation***

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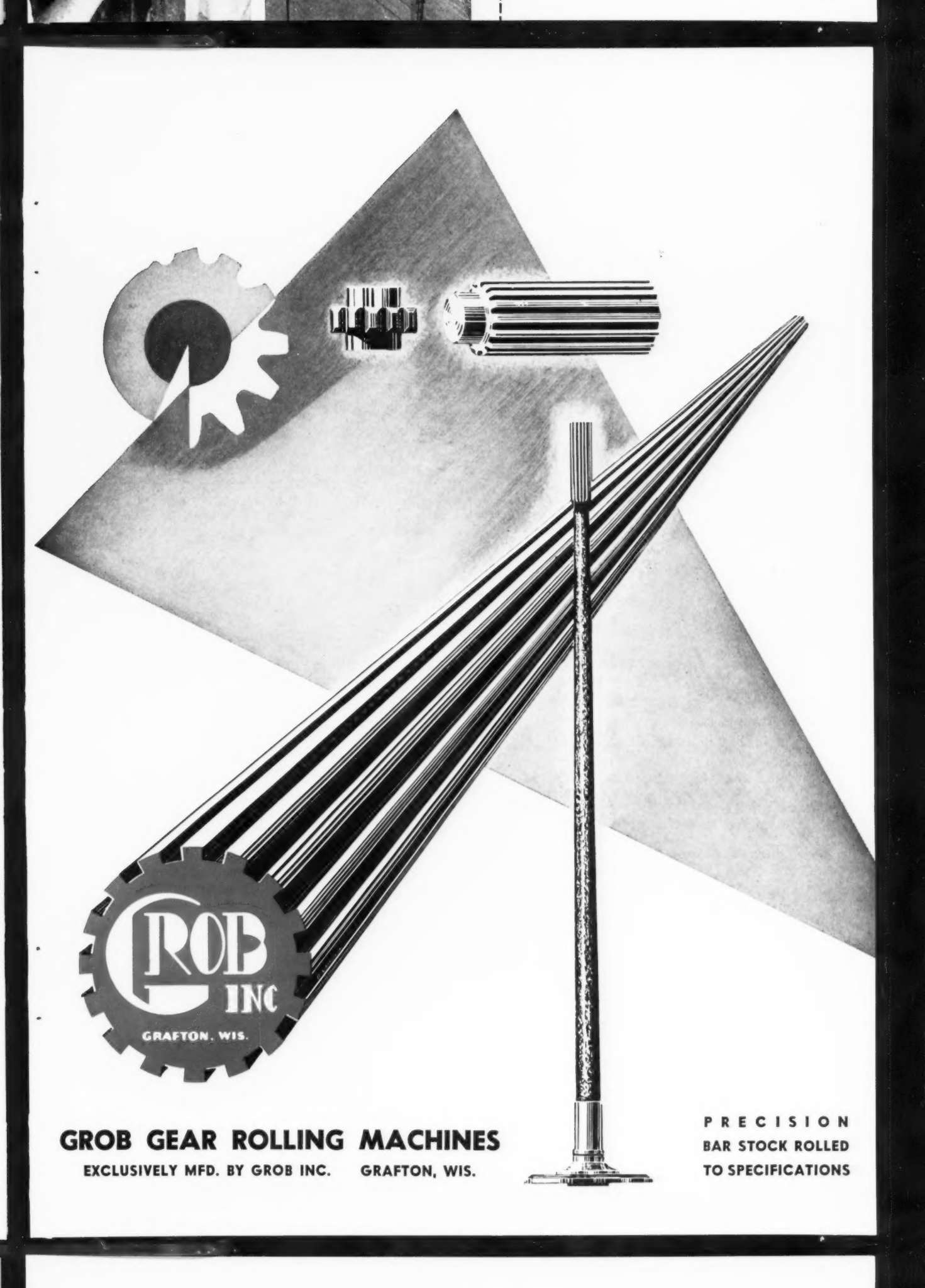

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Duplexing with a 4M Hydro-Arc
An 8MT arcing on a cold charge
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Engineered for today's melting needs

Engineered for today's high production capacity, the Hydro-Arc Electric Furnace is the answer to all your prime melting and duplexing needs. It has fewer moving parts . . . is easy to operate and maintain—economical, too! New hydraulic power transmission . . . automatic clamp and arm for fast, safe electrode slipping . . . patented repositioning equipment for a constant arc even under the most adverse conditions—they're but three of the many advancements that upgrade melting efficiency, produce a better product. In addition, Hydro-Arc's top charging reduces down-time, helps assure more-melt-per-man-hour! Investigate Hydro-Arc today. Send for Bulletin FY-168, the booklet that gives the details! *Whiting Corporation*, 15601 *Lathrop Avenue, Harvey, Illinois.*

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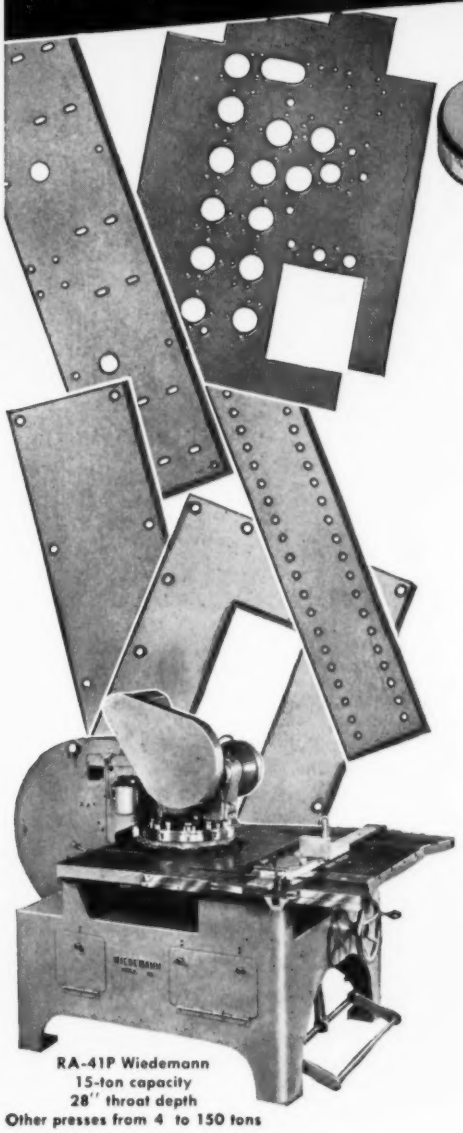
Versatile WIEDEMANN TOOLING *Saves You Money*



RA-41P Wiedemann
15-ton capacity
28" throat depth
Other presses from 4 to 150 tons

6 typical jobs—total cost of tools shown . . . $194.80! That's just the first of many cost-saving advantages of piercing short run jobs with a Wiedemann Turret Punch Press.

Hundreds of Wiedemann users report 60% to 90% direct savings in production of chassis, panels, side rails, etc. —and engineering changes are reduced to a matter of minutes.

Wiedemann Turret Punch Presses require only one punch and die of a size . . . rounds, squares, louvers, groups, extrusions . . . from 0.093" dia. to 7" square and each is ready for use . . . larger openings and notches are produced easily with a series of "hits". Here is real low-cost tooling flexibility.

Why not prove to yourself how much more you could produce for *less* with a Wiedemann. We'll be glad to make a time study of your work. Just send prints and ask for Bulletin 201.

There's a Wiedemann for every short run piercing requirement.

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Vibration won't loosen FLEXLOC self-locking nuts

Where products must be reliable . . . must stand up under vibration, temperature extremes and hard use . . . designers specify rugged, reliable, precision-built FLEXLOC self-locking nuts.

HERE'S WHY:

FLEXLOC locknuts are strong: tensile strengths far exceed accepted standards. They are uniform: carefully manufactured to assure accurate, lasting locking action. And they are reusable: repeated removal and replacement, frequent adjustments, even rough screw threads will not affect their locking life.

Standard FLEXLOC self-locking locknuts are available in a wide range of standard sizes, types and materials to meet the most critical locknut requirements. Your local industrial distributor stocks them. Write us for complete catalog and technical data. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

We also manufacture precision titanium fasteners. Write for free booklet.

FLEXLOC LOCKNUT DIVISION

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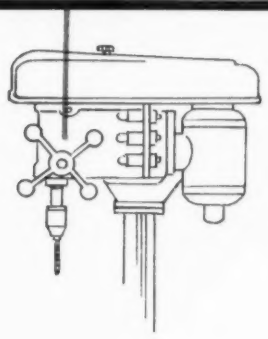
LET'S *Automate* A DRILL PRESS



Like to know more about it?

These two free booklets tell the entire story. Write for them today. Address: Dept. IA-1057. The Bellows Co., Akron 9, Ohio. In Canada: Bellows Pneumatic Devices of Canada, Ltd., Toronto, Ontario.

There are more hand fed drill presses in use than any other machine tool. They are all pretty much alike. The operator positions the work in a jig or fixture, feeds the drill in and out of the work by turning a star wheel by hand, and removes the work from the jig.

A good workman can drill a clean hole. But not too many of them. It's a tiring job. Towards the end of the shift both quality and quantity suffer.

Let's put a Bellows Drill Press Feed on the star wheel shaft. Now, the operator touches a lever. Automatically the drill is fed in and out of the work, under perfect control. Production is increased 20%-30%; quality is better; tool life longer.

Let's go a step farther. Add a Bellows Rotary Feed Table. Now all the operator has to do is load parts. The table automatically positions the part under the drill. the drill press feed automatically feeds the tool, the table indexes to eject one part and position another. Production is more than doubled, often more than tripled.

How much does such a set-up cost? Roughly five weeks wages of an operator buys it. Actually it costs nothing. It pays for itself, often with the first week's cost savings.

The Bellows Co.

AKRON 9, OHIO

MANUFACTURERS OF CONTROLLED-AIR-POWER DEVICES FOR FASTER, SAFER, BETTER AND **LOWER-COST** PRODUCTION

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Moltrup Steel

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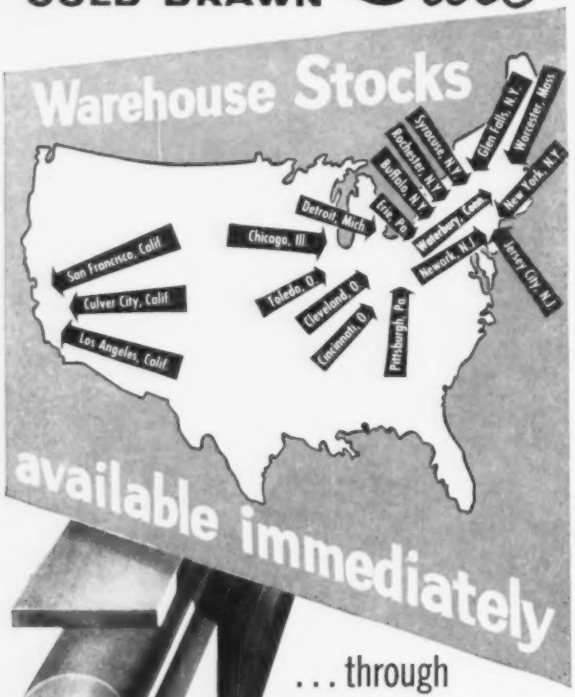


. . . through your *local* Steel Distributor

Your local phone call in any of the cities listed will bring you fast dependable steel warehouse service.

Order FLATS, ROUNDS, HEXAGONS, SQUARES, and ACCURATE KEY STOCKS of MOLTRUP FINE QUALITY COLD DRAWN STEEL.

No need to carry expensive inventories when YOUR LOCAL STEEL DISTRIBUTOR can fill your requirements, large or small, from warehouse stocks of all regular shapes in various sizes.

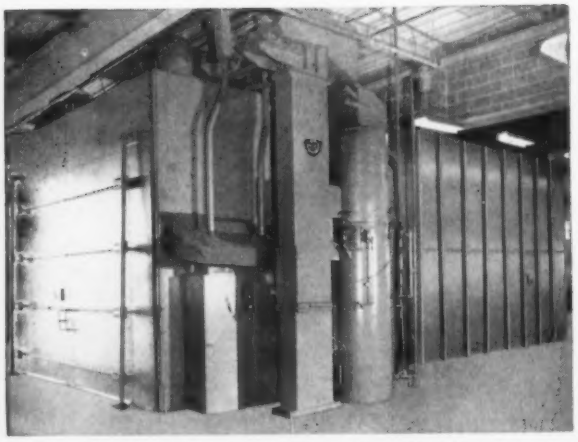
W-1

Consult telephone directory, in cities listed, or ask us for name of distributor nearest you

Phone: Beaver Falls—730

Moltrup *Steel Products Co.*

BEAVER FALLS, PA.



MACLEOD *Custom-Built*

BLAST CLEANING ROOMS

MACLEOD offers complete designing, fabrication, and installation of abrasive blast cleaning rooms, abrasive reclaiming systems, blast generators, and dust collecting systems—designed to meet your specific needs.

The room installation illustrated was built by MACLEOD and is served by a continuous automatic blast generator, abrasive reclaiming and cleaning system, and a dust collecting system with a 54,000 cu. ft. per minute capacity. Write for information on MACLEOD standard or specially designed equipment.

Our 60TH ANNIVERSARY YEAR

The **MACLEOD** Company

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PICKLING TANK TEST in 3 minutes with FERRO PICKLE PILLS

Any workman who can tell red from green and count to ten can test the exact strength of pickling solutions . . . *the exact percentage of iron content*, and the solution percentage of sulphuric acid, muriatic acid, alkali etc. in metal cleaning tanks.

Ferro Pickle Pills provide a quick, accurate test to augment periodic titration testing, or as a "test within a test". They can assure full-capacity cleaning with fewer rejects, save money by eliminating premature dumping of tanks. That's why more and more companies are using them. Why don't *you* try them? Write today for literature and prices.

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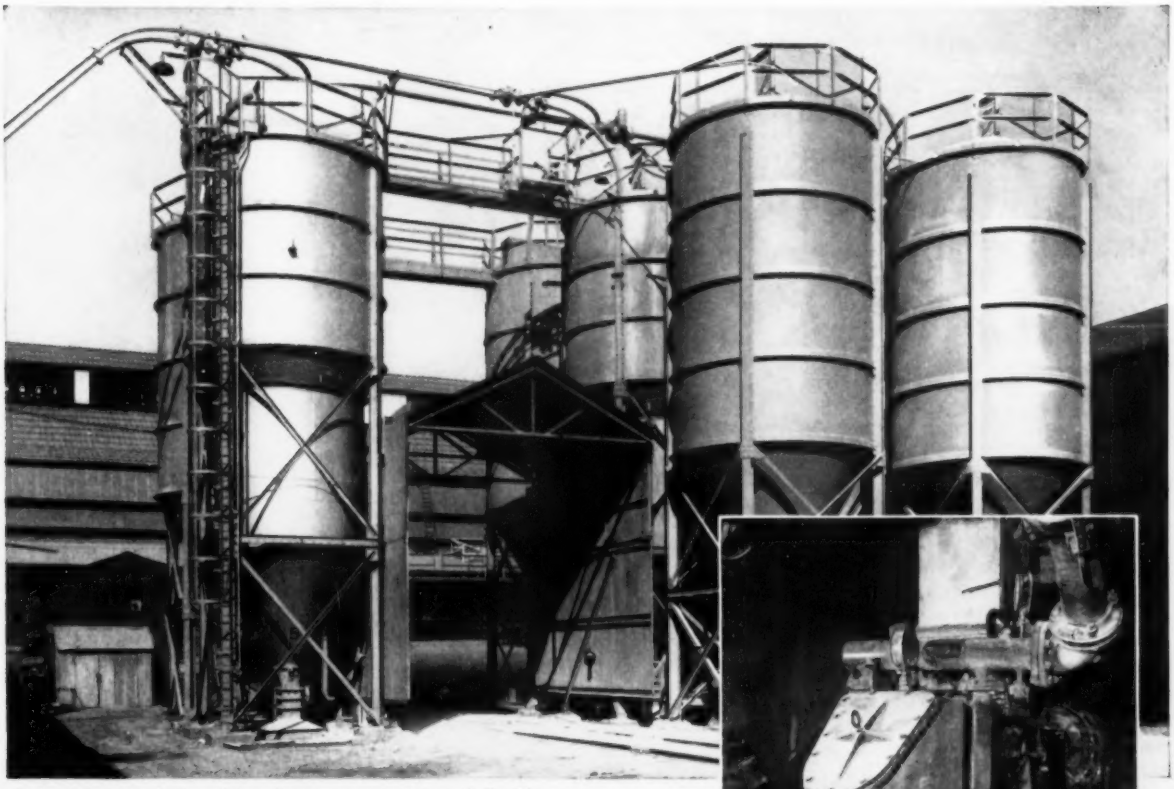
FERRO CORPORATION

Supplies Division

4131 East 56th Street • Cleveland 5, Ohio



Storage bins into which sand ingredients are conveyed by a Fuller-Kinyon Conveying System. Note the pipe-line system which permits ingredients to be conveyed into their respective bins.

One of two Fuller-Kinyon Pumps which convey sand ingredients to storage bins and from bins to mixers.

FULLER-KINYON CONVEYING SYSTEM HANDLES THREE DIFFERENT MATERIALS EFFICIENTLY, WITHOUT WASTE

To reduce costs and speed up handling of foundry sand ingredients with minimum waste, General Steel Castings Corporation, Granite City, Illinois, installed a Fuller-Kinyon Conveying System.

Here's what it does for them—

The system unloads corn flour, silica flour and bentonite from hopper bottom cars by means of Fuller-Kinyon Pumps which convey these materials through pipe lines to a number of storage bins. The flexibility of the system makes it possible to unload cars in a fraction of the time that would be required manually, *and*, waste due to spillage is eliminated. Two pumps used in the operation can be moved on narrow gage tracks for spotting under cars or bins. One pump is used mainly for unloading and delivery to storage—the other for delivery from storage to supply bins above the mixers. However, it is possible to unload cars and reclaim from storage simultaneously. Where bins are located so that they cannot discharge directly to a pump, an F-H Airslide® conveys from bins to the pump.

Prior to the Fuller installation, material was received in bags and manually unloaded, stored and transported to the mixers. It figures—*costs were much higher*. Now, waste has been eliminated! Another important feature—the company has realized extra savings by purchasing materials in bulk.

Fuller air-conveying systems are in operation in hundreds of plants throughout industry, cutting costs and increasing profits, day in and day out. The next time you have a materials-handling problem, why not get in touch with Fuller . . . chances are you will also profit.

FULLER COMPANY GENERAL AMERICAN TRADE MARK

Fuller

. . . . pioneers in harnessing AIR

FULLER COMPANY P-168 4038

122 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION

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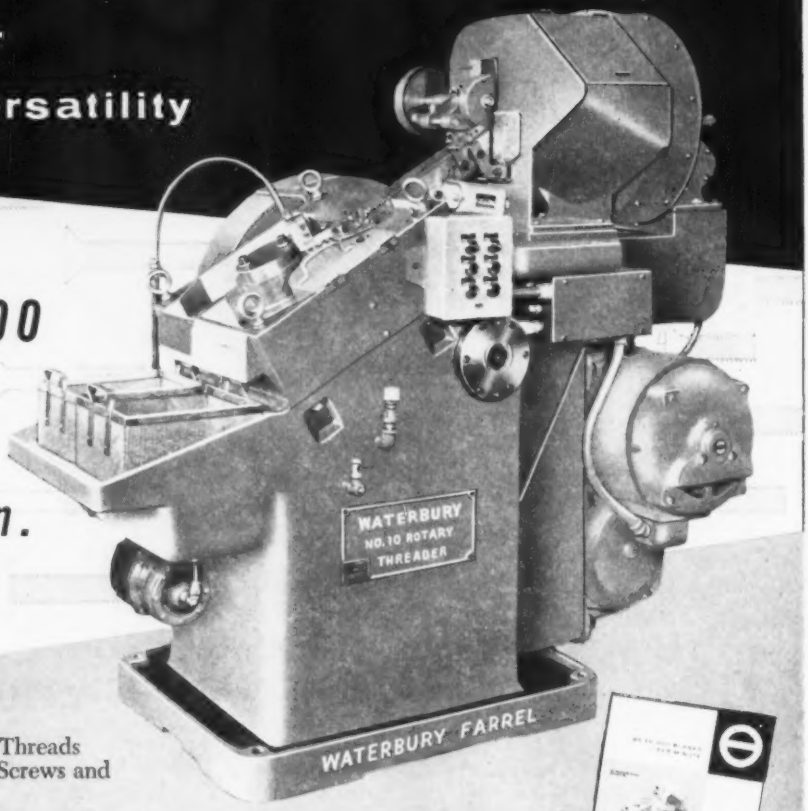
NEW WATERBURY FARREL

ROTARY DIE THREADER

for short or
long run versatility

60 to 600 Blanks Per Min.



- Flexible Production – Threads All Types of Machine Screws and Other Headed Parts
- Handles Blanks from ¼" to 2" long – Threads diameters from #6 to ¼"
- Threads Stainless Blanks at 60 to 200 per min.
- Threads Blanks of standard material at 200 to 600 per min.
- Backed by Waterbury Farrel's Century Long Reputation for Precision and Rugged Design

For further information and specifications on this new low investment machine, send for this free bulletin.

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Power Presses

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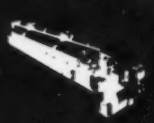
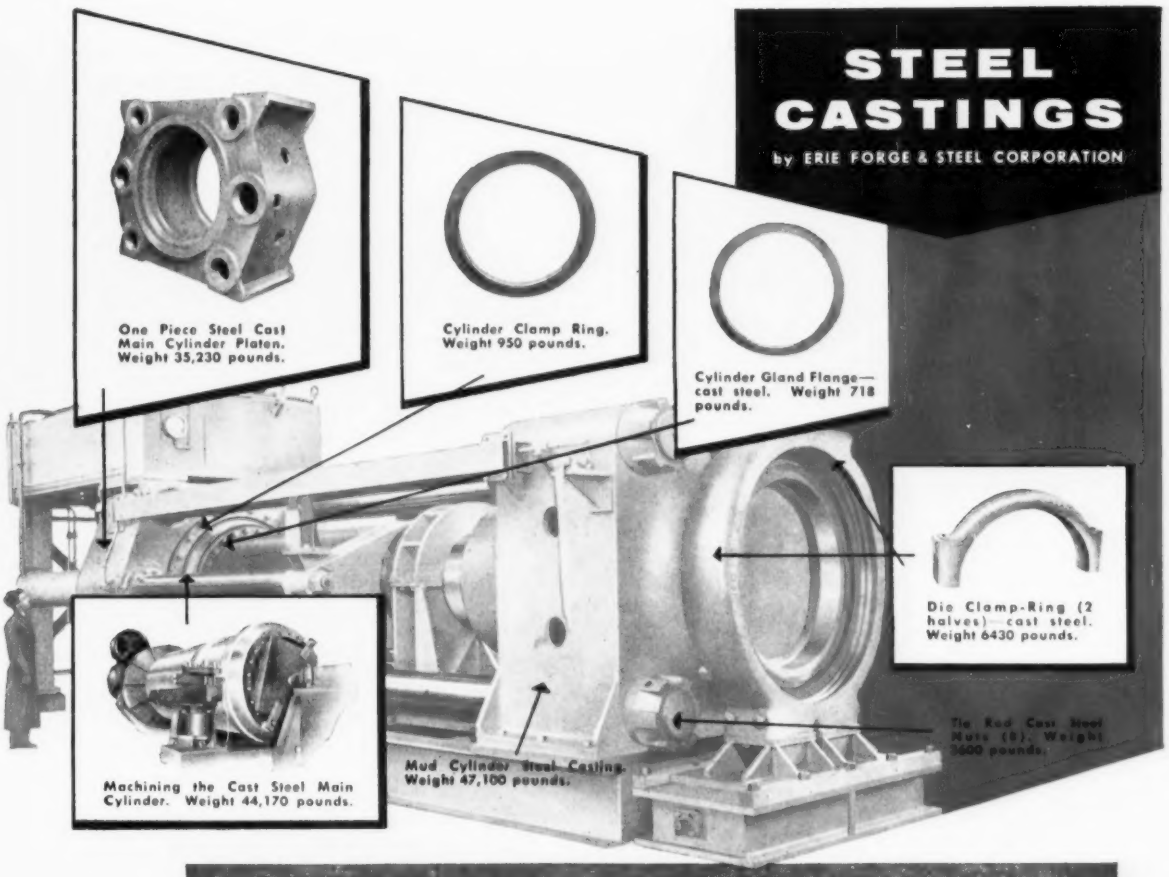

Wire Mill Equipment

Sendzimir Mills and Other Special Machinery

W F 17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by ERIE FORGE & STEEL CORPORATION
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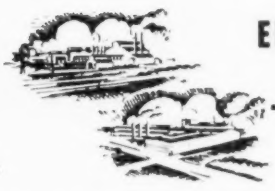
Cylinder Clamp Ring. Weight 950 pounds.
Cylinder Gland Flange—cast steel. Weight 718 pounds.
Die Clamp-Ring (2 halves)—cast steel. Weight 6430 pounds.
Machining the Cast Steel Main Cylinder. Weight 44,170 pounds.
Mud Cylinder Steel Casting. Weight 47,100 pounds.
Tie Rod Cast Steel Nuts (8). Weight 3600 pounds.

— for Erie Foundry Company's 2000 Ton Hydraulic Carbon Extrusion Press

Some 73 tons of steel castings by Erie Forge & Steel Corporation provide the rugged, brute strength built into this 2000 ton Hydraulic Carbon Extrusion Press by Erie Foundry Company in Erie, Pa. Steel castings are made from raw materials to finished product within our plants. The responsibility for the quality and dependability of these components in the finished machine rests squarely upon our shoulders.

Many years of experience in making specification steel components, both cast and forged, for Erie Foundry Company's heavy hydraulic presses and forging hammers suggest that we can serve you in a similar satisfactory and profitable manner. Steel castings and forgings are produced completely here "Under One Responsibility and One Control". Every step in their production from beginning to end is directed and closely followed by our metallurgical quality control and engineering supervision. You may expect a call from your nearest Erie Forge & Steel Corporation field engineer in the near future.



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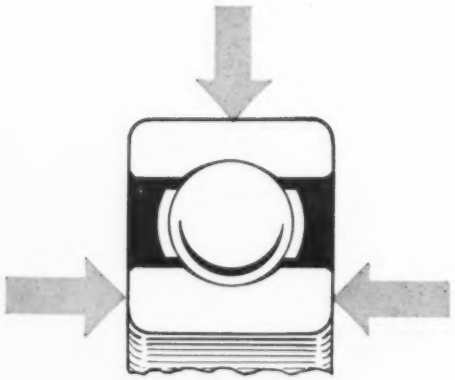

The Word *Versatile*

Fits Like A Glove!

Fits because—this basic New Departure ball bearing, more widely used than any other antifriction type, does much more than carry RADIAL loads—it locates the shaft it supports against THRUST LOADS FROM BOTH DIRECTIONS equally well!

Fits because—with a simple snap ring added, it does away with inside housing shoulders, simplifying mounting and cutting machining costs!

Also—with efficient Sentri-Seal added, without change in exterior dimensions, it eliminates a separate outside closure —assures protection from outside dirt!

And—with Sentri-Seals on both sides, this same basic bearing does away with all separate seals, eliminates all need for lubricating fittings—requires no attention for greasing!

Finally—it is a long-lived, non-separable unit that calls for no shims or other devices for periodical adjustments.

So, specify New Departures of the type that assures you maximum application proficiency and economy.

ND NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

NOTHING ROLLS LIKE A BALL

Electric Furnace Boom?

Partly because electricity produced from nuclear power will be cheaper by 1965, electric furnaces will gradually replace open hearth furnaces. Future furnaces of this type will be largely automatic and will be fully instrumented for all functions, including high speed melt analysis.

Switch Titanium Furnaces

More titanium producers will follow the lead of one company in putting consumable electrode furnaces to work on other metals. This firm plans to produce zirconium and other light metals in addition to titanium. Another titanium source has already converted half its furnaces to the melting of high temperature alloys.

Mill Sales Irk Warehouses

Reaction of steel warehousemen to mill-depot sales is getting rough. They argue that direct sales do not increase tonnage sold, merely cut the size of orders placed with warehouses. Upshot: Some warehousemen say continuation of the practice will throw their cold-finished bar sales deep into the red, leaving them only small, unprofitable orders. Which could mean that some might drop the line entirely.

Money Will Stay Tight

Despite industrial concern over slumping sales, the Federal Reserve Board has no present intention of easing its tight money policy. The Board takes the position that inflation—not a recession—is the real economic threat for the long pull.

Auto Makers Face Strikes

A series of localized strikes over production standards is ahead for auto makers. Because rising costs are not matched by increased productivity, auto firms know adjustments must be made now as 1958 production gets underway. They reason that costs will shoot up next June when new contracts are signed, and that they can best help themselves by tightening up now on a plant-by-plant basis. Several labor flare-ups have already occurred.

More Soviet Surprises?

Russian scientists will probably follow up their satellite coup with news that they have (1) an atomic railway locomotive, (2) effectively harnessed solar energy to generate electricity. U. S. observers expect these announcements about November 7, when the Reds celebrate the Bolshevik revolution. Soviet leaders are believed to be spotlighting scientific achievements to counter dissatisfaction of their people with low living standards.

Geniuses Not Needed

You don't necessarily need mathematical geniuses to program data for electronic computers. Computer experts on a recent panel agreed the job can be done by any person used to tackling logical problems—"the type of man who can handle better-grade crossword puzzles, or one who likes solving chess problems."

Transistors Everywhere

Tiny transistors will be key components of many more types of products as the electronics industry expands into new areas. Typical possibilities include: An automobile fuel-injection system adaptable to all present car engines, telephone carrier systems with more line capacity, all-electronic teletypewriters and many varieties of toys and other miniature equipment.

Titanium's Easy On Oils

When used as bearing materials, titanium and its alloys should not affect the long-time storage life of lubricating oils and greases. Army tests show that the metal and its alloys have only a slight catalytic influence on the oxidation or chemical decomposition of lubricants made to military specifications.

● **WORM GEARING**—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

CLEVELAND-driven processor feeds and levels strip

IN the continuous pickling line at Youngstown Sheet and Tube's new cold reduced sheet mill at Indiana Harbor, this processor levels out the bulges and feeds hot rolled strip to the next station. Efficient performance of both jobs depends largely on the Cleveland drive. Operating from a motor and gear box, the Cleveland worm gear speed reducer drives both tension and leveler rolls of the leveler with a smooth, quiet, steady, torque flow. Ratio is 30:1.

Through 40 years Clevelands have demonstrated the inherently high shock load resistance of quality worm gearing. Worm action on gear teeth is such that, even when severely over-loaded, the danger of sudden failure is remote.

When you install a Cleveland you can be sure you are investing in the finest, most dependable worm gear drive to be had. Write for free Catalog 400. The Cleveland Worm and Gear Company, 3282 East 80th St., Cleveland 4, Ohio.

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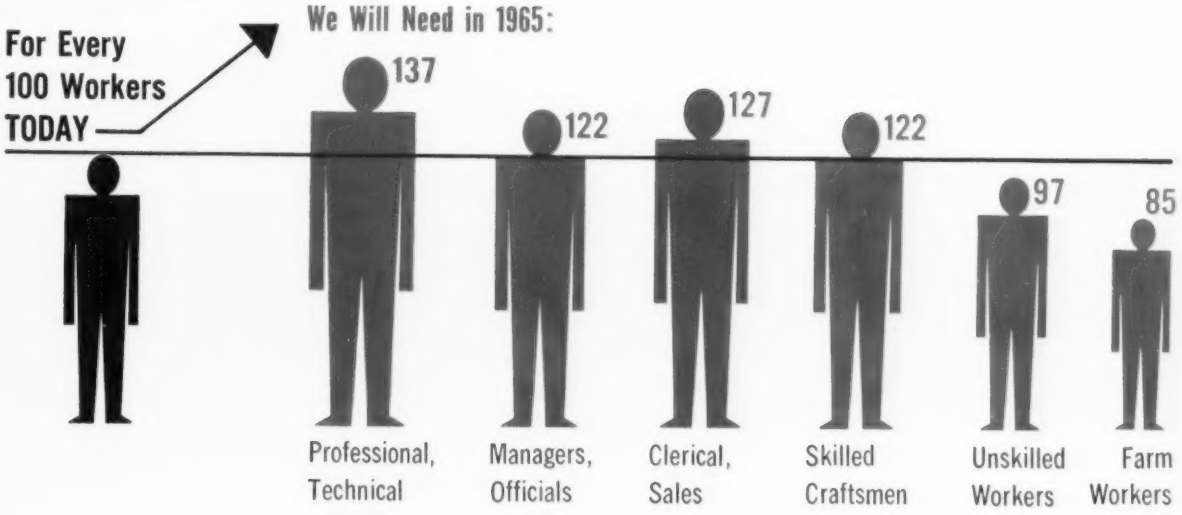
CLEVELAND
Worm Gear
Speed Reducers

Our Changing Labor Profile



There's No Easy Way Out Of Skilled Labor Shortage

But Metalworking Is Making Good Progress

Population gap and need for greater productivity create a long-term shortage of skills.

Industry programs and joint action with schools help solve local problems. Number of trainees is now gaining.

■ In the month of July, the Dept. of Labor reported local occupational shortages at an 18-month low. But in the same period, vacancies in the skilled labor group showed the only increase in the month.

It further reported that "metalworking and mechanical repair jobs continue to dominate the skilled labor shortage."

False Hopes—It's true that in the past year there has been some overall easing in the shortage of skilled labor. And this has led to a moderate degree of false complacency on the part of employers.

But in the long view, the scarcity of skilled labor is going to get worse instead of better. Faced by an increasing demand for skills to meet the requirements of higher productivity, only increased programs of training in individual plants and industry-wide will prevent an even more acute shortage in the next ten years.

Population Problem—In addition to the need for a greater percentage of skilled workers, industry is caught in a population cul-de-sac. Because of the low birth rate of the 30's, the number of workers in the 25-44-age group, where the most skilled workers are usually drawn, will be declining while the population as a whole is gaining.

As Under Secretary of Labor James T. O'Connell points out: "The employer who believes he can staff his plant during the next 10 years with bright young men between the ages of 25 to 34 is in for a disappointment. There will be nearly ¾ million fewer of them than there are today."

Productivity Demands — There are any number of ways of looking at the skilled labor demand, but the answer is always the same: More training is needed.

The value of goods and services per worker, as measured by gross national product, in 1965 will be $7500 a year. In 1955 the value per worker was $6190. Obviously, greater technical skills will be needed to produce the greater wealth.

In a down-to-earth evaluation,

Chrysler Corp. skilled workers in 1955 comprised 10.4 pct of the hourly work force compared with 6.5 pct in 1939. This rate of increase will accelerate, not decrease.

Too Much Pirating — Industry, and metalworking, is facing up to the problem in widely divergent ways. Some companies are doing nothing about training, solve their short-term problems by recruiting, more appropriately called pirating.

Secretary of Labor James P. Mitchell recently admitted he was "shocked to learn that there are no more skilled craftsmen on the job today than there were five years ago." He also points to figures showing that between 1951 and 1956, there was a drop of 28 pct in the number of skilled craftsmen under 25 years of age.

"Instead of training the workers we need, we have sought to steal them from competitors. Pirating . . . has become a widespread practice among some employers," he charges.

More Are Training—But there is a lot of evidence that pirating is on the wane. It does not solve the long-term problem and, in the long run, is more costly than a training program.

While there is no easy way out, many companies and industries are solving their own problems. Initially, they may consult the Dept. of Labor's Bureau of Apprenticeship and Training for help in developing and improving training programs. In fact, the number of apprentices in training has shown a significant increase in recent years.

Some companies, confronted with a common problem, have met the situation with joint action. Larger companies, with greater facilities, are meeting the problem in their own programs.

How It's Done—In the Chrysler Corp., for example, where skilled labor is now well over 10 pct of its working force, apprentices are recruited through referrals by high schools and generally making opportunities known, frequently through fathers among Chrysler workers.

Under the contract with the United Auto Workers, the ratio of apprentices in training to a journeyman is one apprentice to five journeymen unless otherwise agreed locally.

Before they are hired, prospective apprentices are given tests and interviews. Those passing are put on lists of those available for various jobs. Higher paying skilled trades, such as diesinker and toolmaker, attract greatest number of applicants.

Pay Scales — Apprentices are given a 5¢ hourly raise when they complete their first 1000 hours, 5¢ raises at the end of 2000 hours and 3000 hours. Thereafter, they are given a 10¢ hourly raise at the completion of each 1000 hours of training—up to a maximum of 10,000 hours.

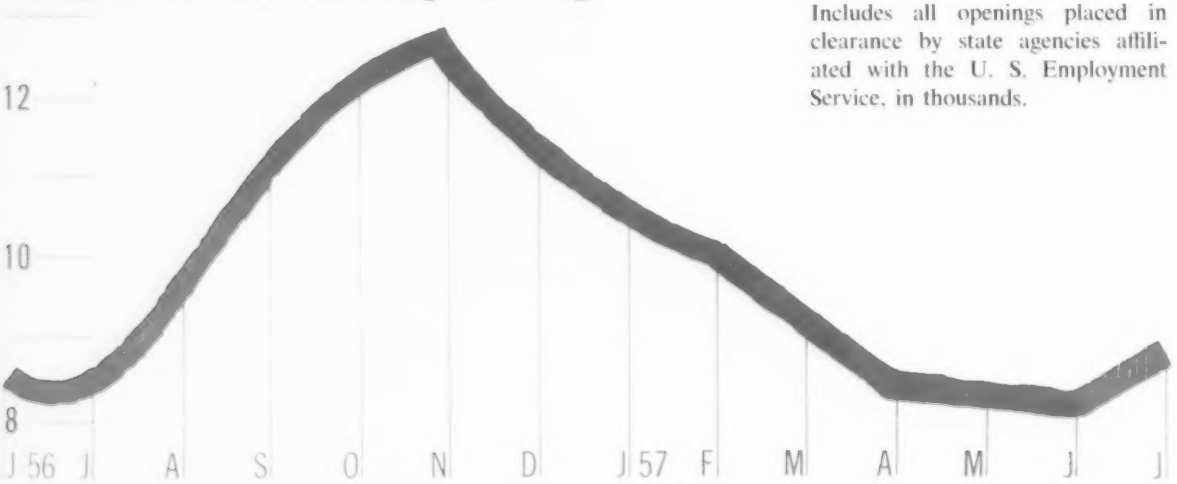
"We believe the skilled trades will be increasingly important in the years to come," a Chrysler spokesman says. "Because the skilled trades carry many advantages, such as higher earnings and more interesting work, we will be able to attract an adequate number of recruits five years from now."

Small Shop Program — On the other side of the automotive picture is the Automotive Tool & Die Society, representing the majority of independent tool and die manufacturers in Detroit. With these shops, the shortage of skilled labor has existed since about 1940.

Some 650 apprentices are now in training in tool and die jobbing shops. Five years ago, only half that number were in training. The union allows one apprentice for eight journeymen.

Some Resistance — The association shops have little raiding by the big auto companies because of superior benefits given by member

Is Skilled Labor Shortage Easing?



Job Openings, Skilled Labor

Includes all openings placed in clearance by state agencies affiliated with the U. S. Employment Service, in thousands.

shops. Competition has forced independent shops to boost wages substantially above those of the large automakers. Also, a pension plan is managed by the society, so a man's credits follow him to another shop within the society if he changes jobs.

In spite of the need, not all theoretical openings are filled, although the Automotive Tool & Die Society has a list of 400 qualified applicants on its waiting list. Many shops don't like to train a man only to have him leave for another employer. However, the society believes the increase in number of apprentices shows progress toward filling needs of the shops.

Steel Industry—In the steel industry generally, there is no shortage of specialized skills at the moment, but an experienced craftsman "would have no trouble making a connection," according to one industrial relations man.

Apprentice programs are in operation throughout the industry. U. S. Steel has about 2000 men in its apprentice program. The practice of pirating has died out in the steel industry. If a man is employed at the time he applies for a job, the mill will frequently clear the hiring or check with his employer.

In one Midwest heavy equipment manufacturer, patternmakers, tool designers and machinery repairmen are particularly short. Apprentices have been filling the gap for welders, electrical equipment workers.

Easing in Chicago—In the Chicago area, layoffs in farm equipment, car building, appliances, aircraft, road-building equipment, and automotive, have temporarily taken some of the sting out of the skilled labor shortage. Pirating practices of 1955 and first half 1956 aren't nearly as common.

An example of collective action occurred this year on the West Coast among screw machine products makers. In Los Angeles, a program to train skilled workers is under way, with screw machine products firms working with educational organizations.

Metalworking Skilled Trades at a Glance

	July 1957	June 1957	July 1956
Job Openings			
Toolmakers, Diesinkers, Setters	1,046	1,083	1,355
Machine Shop and Related	929	815	1,074
Tinsmiths, Coppersmiths, Sheet Metal Workers	186	136	465
Welders and Flame Cutters	483	411	344
Aircraft Building Occupations	561	551	29
Fabricated Plastics Occupations	75	76	1
Pattern and Model Makers	410	407	305
Machinists	735	777	1,016
Mechanics and Repairmen	1,219	1,315	900

Group Action—This branch of industry is expanding rapidly on the West Coast, resulting in an acute shortage in an area that is known for its chronic famine in skilled labor.

According to the National Screw Machine Products Assn., it's the biggest group training project in this industry. To meet the West Coast shortage, an industry committee worked with state and Los Angeles school officials.

One of the biggest problems was the shortage of teachers. To solve this problem, "teachers" were recruited among experienced screw machine foremen and operators. In February of this year, the teachers selected began a three-hour per week, 20-week course in teaching methods at the Division of Vocational Education at UCLA, in cooperation with the State Dept. of Education. On completion, they received Class D vocational credentials.

100 Enrolled—With the problem of teachers solved, the actual training school was launched. Now, approximately 100 students are at work on a four-semester course of instruction in a broad range of screw machine theory and operation.

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Can We Recoup on Missiles?

Red Satellite Brings High Tide of Criticism

Is too much internal rivalry holding back our missile development?

Public demand for economy now is drowned out by cries for speedy action.—By N. R. Regeimbal.

▪ The man on the street, kicked abruptly into the age of monstrous missiles and space flight, has only one reaction to Russia's successful earth satellite: This country's got to get moving.

Whether we're actually behind or even with the Russians in production of usable arsenal of nuclear bomb-carrying missiles isn't clear—and to most Americans, it probably doesn't make much difference. Sentiment is clearly that we should be ahead.

This is the challenge to the government and industry.

Reappraisal Coming—The effect of this massive muttering, confusion, and even slight hysteria inevitably will add up to demands for a nosecone-to-tail-fin reappraisal of the country's entire missile program.

And the almost inevitable result of this reappraisal will be a speedup in missile research and development and production, and more spending, whether it's needed or not.

More Probes—This will undoubtedly mean more money for missile procurement, for research and development, increased emphasis on scientific education, and more funds for pure research.

New Defense Secretary Neil H. McElroy predicts a rise in missile spending.

At least one, and possibly several, congressional committees probably will get into the "why weren't we first and how can we speed up our missile development" investigating picture.

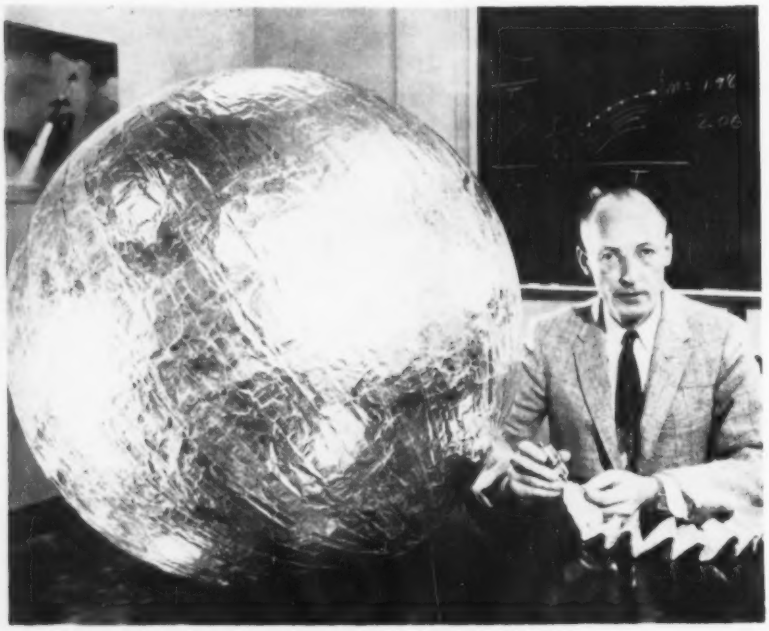
Need for Unity—There is a strong show of sentiment that our missile efforts, brainpower, and facilities have been spread too thin. Too much fighting between rival services and rival companies; an almost complete lack of idea exchange between various missile projects with the resulting duplication of effort, and poor morale among frustrated missile scientists, has caused a logjam in our own missile program.

Demands for a single missile command, comparable to the Manhattan (atomic bomb) project of World War II whereby all our resources would be in a single program are increasing. It may well presage a reorganization of our missile efforts.

No Appropriation Cuts—The re-evaluation and inevitable push in the U. S. missile field, with or without formation of a central missile command, may or may not mean the end to defense economies. It will mean more business for missile contractors and subcontractors.

One thing is clear: The U. S. satellite project—termed project Vanguard—was not slowed down by a lack of congressional appropriations. Congress thus far has given the Navy, which runs the Vanguard project, every cent of the $110 million requested, and this year made it clear it would grant virtually whatever was asked next year.

Budget Outlook—Similarly, there have been no important cuts in the requested budget for missiles or for research and development in missiles. If there has been a shortage



SPACE-BALL: A 30-in. aluminum foil sub-satellite is shown inflated and deflated by its designer, W. J. O'Sullivan of the National Advisory Committee for Aeronautics. It will help determine air density 300 miles up.

of funds, the blame seems to lie in the failure of the Administration to request the funds; a diversion of funds to other purposes; or just that it was spread among too many competing projects.

Next year, there will be demands for a vastly increased defense budget. Whether the increase in missile funds comes from curtailment of other defense programs, or brings another rise in the budget, will depend to a large extent on how much the public's demand for government economy and tax cuts has been washed away by concern over the missile race.

In Retrospect—There is little question that more money a few years ago would have meant a faster and better missile program. Just how much we could have speeded up our development is open to question.

As it stands now, the Navy plans to test in a week or so the third stage of the missile which will put our moons into orbits. And early in December the Navy plans to launch four complete rockets.

Army Claims—As an example of the frustration in the U. S. missile program, top Army officers and civilian scientists working for the Army rocket program say they offered as far back as 1955 to launch a satellite by using their short-range Redstone missile. Reports are that they could, with only a few modification, launch one today.

But the U. S. is going to stick to its scientific objectives in the satellite, using a small three-stage rocket to launch a relatively small satellite which will, the scientists claim, be a technical masterpiece, far ahead of the Russian moon in its ability to collect information up to 1500 miles in space.

Dummy Warhead—The point often made, however, is that the Russian satellite actually represents a dummy warhead of an intercontinental missile, which could, with only a change of angle, spread devastation in this country.

WIND TUNNEL TEST: Scientist checks an experimental aircraft model in a supersonic wind tunnel at Lewis Flight Propulsion Laboratory in Cleveland. Air stream can be whipped up to 3½ times the speed of sound.

Heat Blocks Way To Faster Aircraft

Engineers are making slow but steady progress toward a 2600 mph airplane.

The primary problem: Finding a suitable high-temp material.

▪ Aircraft and rocket engineers in Cleveland aren't bashful about showing designs for aircraft which will go 2600 mph hour. Yet they are pinned down by the heat barrier where progress is still measured in inches.

Some of its awesome problems were outlined last week at a triennial inspection of the National Advisory Committee for Aeronautics' $100 million Lewis Flight Propulsion Laboratory.

Progress Review — In the 10 years since the first supersonic flight by Capt. Charles Yeager in the Bell X-1, designers have had a net gain of only 300°F to work with, spokesmen said. They currently have turbine blading which will withstand 1650° without losing necessary strength. This is up from 1350° in 1947. But in the next 10 years they are hoping for 1850° to 2500° materials for gas turbines. For ramjets they need 2500-3100° and for a nuclear powered rocket, 5000° material.

Possibilities are nickel with sintered aluminum alloys, columbium and tungsten. Ceramics hold some hope. Lewis research men have been able to impart a measure of ductility to ceramics by eliminating surface imperfections by water polishing. Ductile ceramics developed so far are magnesium chloride and sodium chloride.

Fuel Problems — The materials problem is the most pressing at Lewis, but there are others. With high energy fuels already tested, engineers hope to extend the range of supersonic aircraft and missiles by 40 pct. Liquid fuels containing boron are the most promising so far, but excessive deposition cuts efficiency.

Atomic energy powered aircraft seems still a long way off. The weight of pilot shielding necessary is still the top problem. Engineers are chipping away at it through better shaping, split shielding and searching for new materials. Decomposition of the metal through radioactivity is still another hurdle,

Industry Looks at Thermal Image

Thermal image camera records heat, not light, through infra-red emissions.

It opens up a wide field of interest for many metalworking applications. Big asset is ability to measure relatively low temperatures.

▪ Metalworking is adding a valuable new tool to its kit — the thermal image camera. Using infra-red radiations instead of conventional reflected light, these cameras yield a picture showing heat emitted at all points on the object photographed.

Originally developed for the military, thermal image cameras are moving into the industrial field. Barnes Engineering Co., Stamford, Conn., this week showed its Far Infra-red Camera, aimed squarely at industry. Earlier this summer U. S. Steel announced it has been using an "evaporagraph", a heat-image camera developed by Baird-Atomic, Inc. Producers are sure that a host of industrial uses will come in with a rush.

Heat, Not Light — In simplest terms, the heat image camera records infra-red emissions from any given object instead of light reflected from it, as in conventional photography. Just as a conventional photo is whitest where the light hits the film most strongly, the heat image picture is lightest where the infra-red emissions are strongest—that is, where the object is hottest.

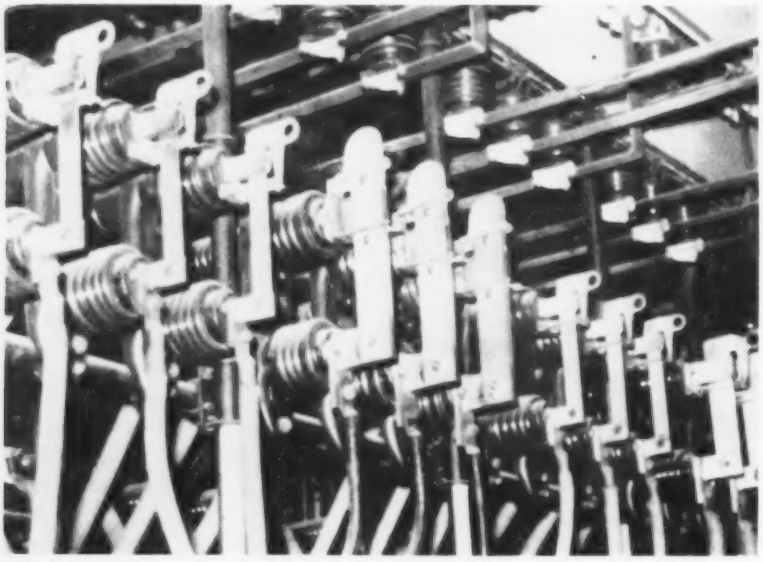
The continuous gray tone gradations from black to white in light-image photos represent varying degrees of light. Similarly, degrees of grayness in Barnes heat-image photos show variations in temperature. Each point on the photo indicates the heat emitted at that point on the object. By means of a gray scale incorporated into the picture, temperatures can be read directly from the photo—a feature Barnes is stressing heavily.

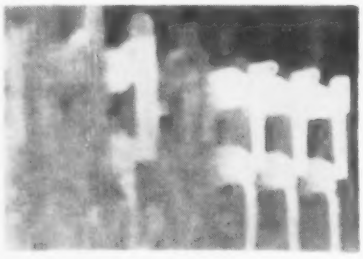
No Special Film — The Barnes camera is designed so that the actual photo is a light image. This is accomplished by using infra-red emissions to control a light beam within the camera. This means that special film and processing is not required. As demonstrated, the camera component proper is a Polaroid Land camera, which permits finished pictures in about one minute.

Exposure time varies from 2 to 15 minutes depending on sensitivity and detail required. Sensitivity of the camera is high. It can record temperature differences as small as 0.02°C. Barnes displayed photos of a person in which blood vessels could readily be picked out from the surrounding skin area.

For Cool Use—Barnes stresses that the great utility of thermal photography—and infra-red detection in general—is its ability to detect and measure relatively low temperatures. There are many ways of measuring temperatures at red heat and above, but not for "cool" objects below 1000°F. It is with objects below 1000°F, with no visual sign of heat, that thermal photography is most useful.

U. S. Steel has found that heat pictures of the exterior surfaces of high-temperature operating units make possible the study of interior wall conditions in such installations as openhearths and blast furnaces —a long-felt want. And the heat camera also shows promise as a detector of hot-spots or worn areas in machinery, steam lines and other mill equipment where temperature is a measure of interior conditions.



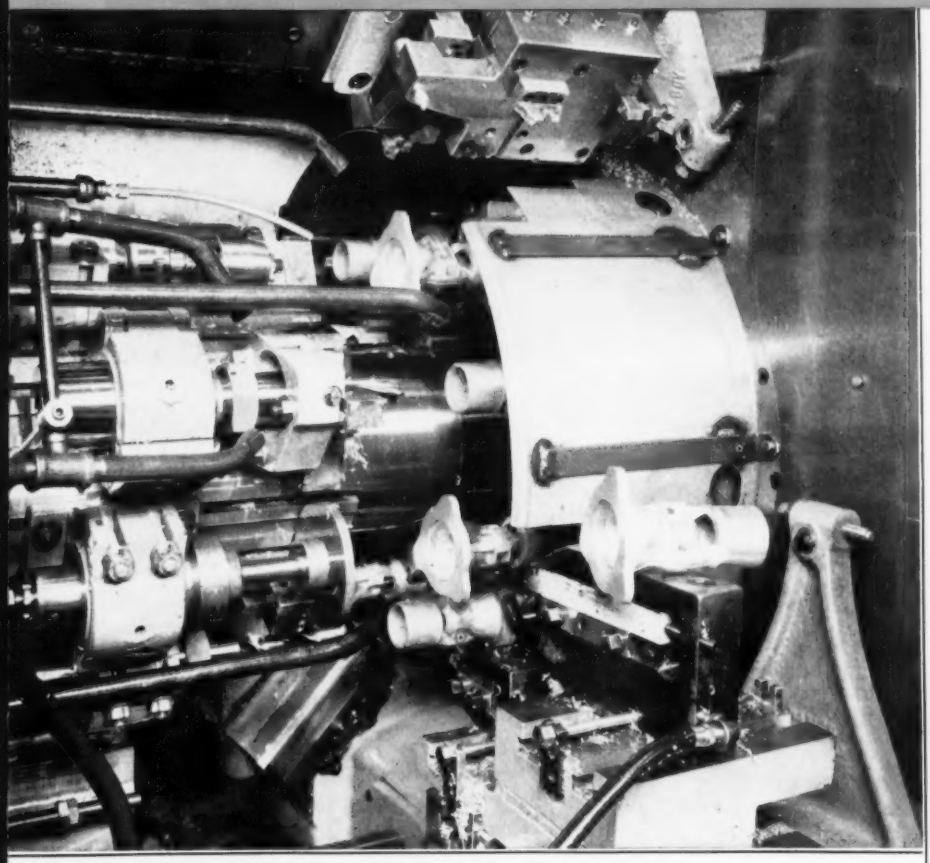


Hot Spots — Thermal image of bank of switches, above, shows overheated elements, can pinpoint bad contacts or danger spots.

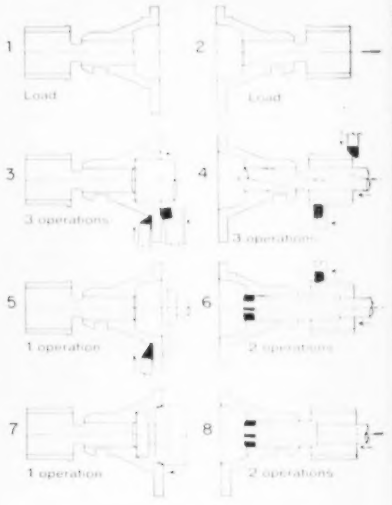
Conventional photograph at left gives no hint of trouble. This is a simplified illustration of how thermal camera works. The new concept is a natural in detecting trouble spots in metalworking.

Acme-Gridley

RPA-8 SPINDLE CHUCKER



BASKET HUB
ALUMINUM DIE CASTING
Double indexing—both ends completed at one setup on 6" RPA-8 Acme-Gridley Chucking Automatic.



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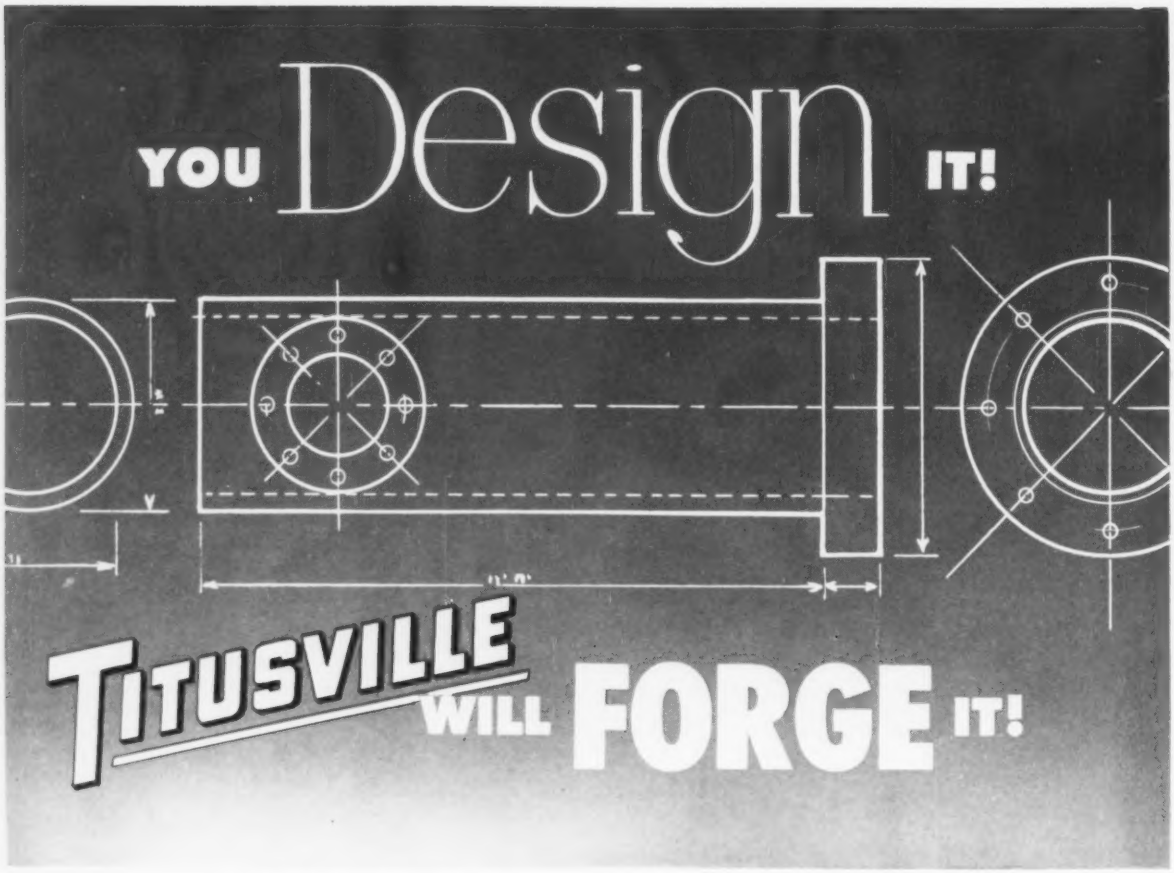

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Alan Wood to Enter Iron Powder Business

Alan Wood Steel Co., Conshohocken, Pa., will use the "H" Iron Process to make iron powder. The company will spend $3.6 million to build a plant with a capacity of 50 tons per day.

Harleston R. Wood, company president, says his company's capacity will be equal to 25 pct of the total market, when the plant is finished in about 18 months.

Lower Costs — Mr. Wood said the new process will give Alan Wood the lowest production costs in the field.

The raw material will come from the company's Scrub Oak Mine, Dover, N. J. It will be concentrated in a new mill being built at Scrub Oaks as part of the project.

Shoot for Auto Market—One of the major markets for iron powder is automotive. The average car uses 12 lb of metal powder parts, says Alan Wood. Large quantities are also used for coating welding rods, and flame cutting of stainless steel. The company will not make powder metal parts.

Shake-up at BDSA

Business and Defense Services Administration—the federal government's advice-for-industry office—is undergoing a major shakeup and will emerge under a new title late this year.

A new title has not yet been selected, but top-layer planners in the U. S. Department of Commerce (the parent agency of BDSA) are seeking a title that more aptly describes the functions and operations of the agency.

Present title is not sufficiently descriptive to those outside Washington, the planners admit.

In addition to announcing the reorganization, the Department of Commerce also will announce new appointments and new titles for many of the directors and industry advisors (most of the latter are WOCs — dollar-a-year men) in BDSA. The mainspring of BDSA is the 23 separate industry offices which prepare and make available to industry facts on production, sales, and marketing for virtually all the nation's industries.

Will Humphrey Testify?

National Steel Corp. is tentatively scheduled to follow Bethlehem on the witness stand before the Senate Antitrust Subcommittee hearings.

Under present plans, Bethlehem will run for three or four days after the hearings resume Oct. 21, and National will be called to follow them. The subcommittee, headed by Sen. Estes Kefauver, D., Tenn., hopes to get National's Board Chairman, George Humphrey, former Treasury Secretary, on the witness stand.

Aluminum Cans for Sale

Continental Can Co. is ready to put several different styles of aluminum cans on the market. In addition to three-piece and drawn cans, Continental will offer impact extruded aluminum cans.

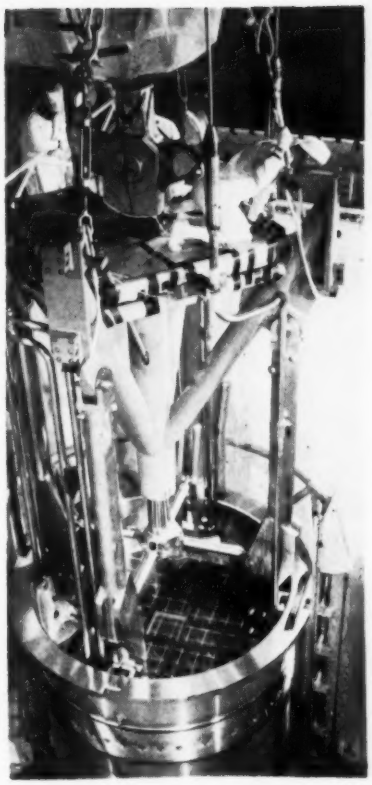
The company said the initial cost would be higher than tinplate, but expects this to come into line as economies are effected. (The IRON AGE, Oct. 10, P. 76).

Granite City Growth

Nicholas P. Veeder, president, Granite City Steel Co., St. Louis, says his company's gross property account will reach about $149 million by the end of next year. This is an increase of $119 million since 1950.

Inland to Double

Long range planning of Inland Steel Co., Chicago, is based on the assumption it must double capacity in the next 20 years, says company president Joseph L. Block. He cites a growing population and improving standard of living.



LOAD: Nuclear fuel charge is lowered into nation's first full-scale atomic electric generating plant. This Shippingport station is joint venture of AEC and Duquesne Light. Westinghouse designed and developed nuclear portion.

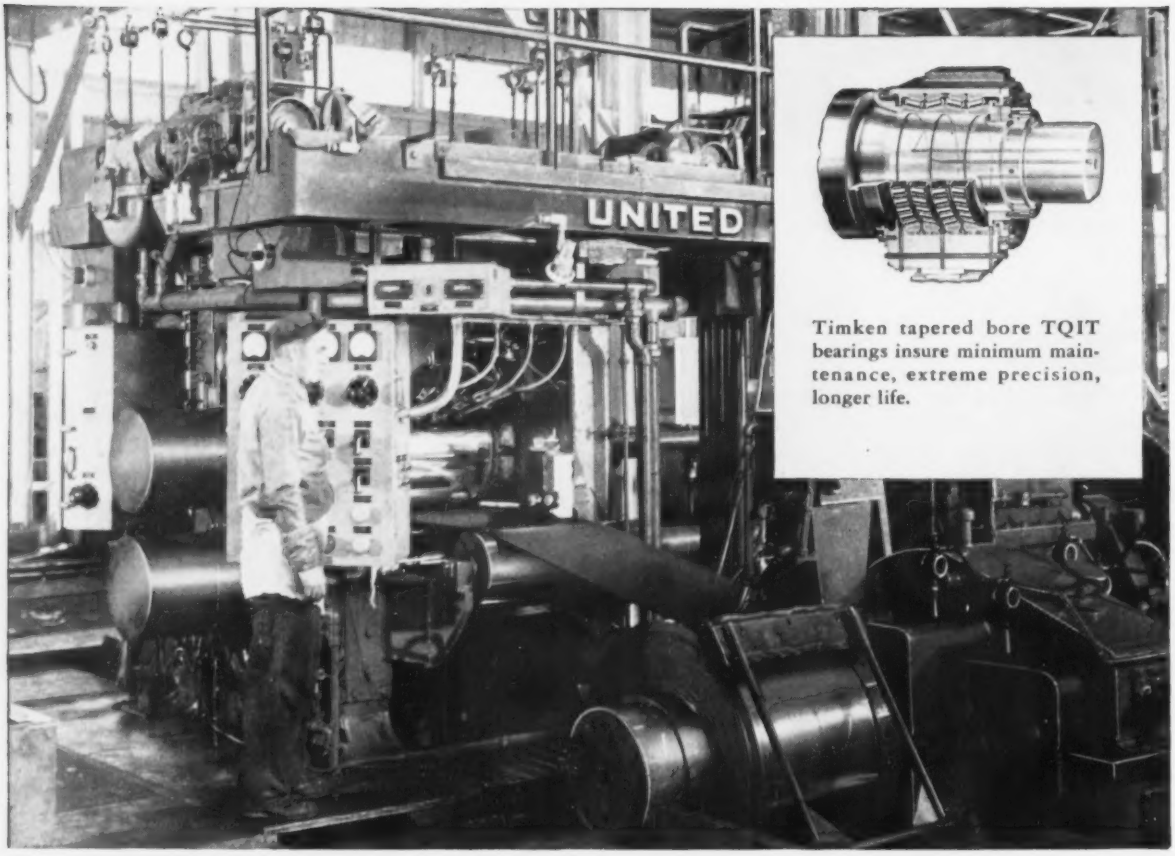
The 58-ton, multi-million dollar core is shown in the final stages of being lowered into the pressure vessel, or steel container, of the installation.

Gerrard Steel Shift

Clifford F. Hood, president of U. S. Steel Corp., today announced plans to operate the Corp.'s Gerrard Steel Strapping Div., as a part of U. S. Steel Supply Div.

Mr. Hood said that this move in the direction of simplification of organizational structure is designed to provide improved service to Gerrard customers.

Gerrard Steel Strapping supplies a flat and round steel strapping service to all types of industries, including engineering design and special applications.



Timken tapered bore TQIT bearings insure minimum maintenance, extreme precision, longer life.

2-High temper pass mill starts faster runs smoother on TIMKEN® TQIT bearings

THIS 2-high temper pass mill, built by United Engineering and Foundry for Alan Wood Steel Company, uses tapered roller bearings of the TQIT type, designed and developed by The Timken Roller Bearing Company.

Higher mill speeds are possible with Timken® bearings. They reduce starting resistance. That's because Timken bearings practically eliminate friction. Their geometric design gives them true rolling motion. Precision manufacture makes them live up to their design. All this makes for smoother, more dependable operation.

Timken tapered bore bearings combine interference fit with easy removal. They can be removed from the roll neck by expanding the cones hydraulically. Excessive scuffing and neck wear are eliminated. Greater stability between cones and roll neck distributes the load within the bearing. Improved fillets and larger necks are possible. This means you get the lowest possible neck stress and deflection.

Lubricant costs are cut because Timken bearings use economical grease lubrication. No lubricant is lost during roll changes. And rolls can be changed faster because there are no tubes or pipes. The tapered design of Timken bearings lets them take radial and thrust loads in any combination—no need for special thrust bearings that increase costs and complicate designs.

Be sure you get all the advantages of Timken TQIT bearings in the machines you buy or build. For more information call or write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

TRADE-MARK REG. U. S. PAT. OFF.

See the next Timken Televent hour, "The Innocent Years" over NBC-TV, Thursday night, November 21st.

Colonel Henry C. Thayer

He Does Business for the Army

Col. Thayer's shoulders carry more than spread-eagles and epaulettes.

Responsibility for a large portion of Defense Department procurement is his.

After 22 years in the 'business', he has some sage advice for government order seekers.

COL. H. C. THAYER: Be sure of your ground before you bid.

▪ Many a would-be contractor, eager for a bite of what looked like a juicy government order, has been saved from business suicide by Col. Henry C. Thayer.

"When you turn in a defense contract you want to do it on a knowledgeable basis," advises Col. Thayer, who is commanding officer of the Philadelphia Ordnance District. Too often, he says, an uninformed company will take a wild stab at a contract hoping that if its bid is too low to realize a profit, an adjustment can be made later.

Small Business Aid—"That's a risky business," the colonel warns. More than one company has taken a beating after insisting that its bid be recognized against the advice of the Ordnance District. A few have had to close their doors.

"The Army has small business specialists hired to help you out," he continues. "From experience, we know pretty well what prices should be." If an unusually low bid turns up, the bidder can expect to be questioned. If he can justify it with a faster, more economical process, he probably will get the order on a silver platter.

Many Talents — Keeping the Armed Forces in up-to-date equipment is perhaps one of the biggest jobs in the U. S. today. As commanding officer of one of the largest (in dollar volume) of the nation's 14 ordnance districts, Col. Thayer is responsible for $2½ billion in Defense Dept. contracts with industry.

To do the job right, he has to be a combination of many things: engineer, businessman, consultant, diplomat and—naturally enough—a military expert. Sound judgment on his part can save taxpayers many, many dollars. An error can be costly.

His Background — Choosing the men on whom so much responsibility rests is a long range project for the Army. Col. Thayer has emerged a top-notch procurement officer after 22 years careful cultivation.

A West Pointer, Class of '35, he got an MS degree from Massachusetts Institute of Technology in 1938. He attended Harvard Graduate School of Business in 1949-50, and the Industrial College of the Armed Forces in 1954-55.

Result: An Expert—During World War II, he served as ordnance officer for the USAAF Anti-Submarine Command, New York, and for the 13th Air Force in the South Pacific.

Col. Thayer understands the contracting and production problems of every weapon and shell the Army has at its disposal. And he has available the dope on how they are made and what they should cost. His advice to prospective contractors: Be sure of your ground before you bid.

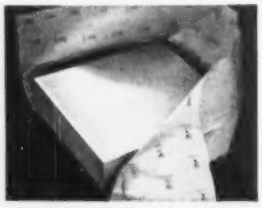
how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.



How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

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For over 38 years—
"Paper Engineers" for Steel

It's Time to Look at the Trend

You can't ignore some of the factors that are beginning to take form in the business picture.

Gains in metalworking are now less than seasonal. A period of leveling is likely before long-term factors take hold.

▪ The average businessman has spent a lot of his time in the past year looking, generally in vain, for a business trend to develop.

To a certain extent, this is still the case. Output of most goods continues relatively stable, employment and income continue near record highs. Best of all, the consumer is holding up his share of the economy with a high rate of spending.

Two Reasons—Why the worry? There are two things that concern metalworking. One is the leveling off of the capital goods boom that has held the economy at a record level for about two years. The second is that gains in consumer spending are concentrated in nondurables and services, while consumer durables have not gained, or even held their own in recent months.

There is little reason to hope for a significant change. In capital spending, for example, the machine tool builders have looked to Detroit all year for indications of a new engine program to bolster sagging new orders. It hasn't materialized. This is just one example.

Seasonal Gains Only — Basic metals producers are enjoying a mild upturn that should last through the first of the year and into 1958. But they are becoming resigned to the belief that the gains are only seasonal, do not portend any great upturn.

As another indicator of the times, the nation's railroads predict a 2.1 drop in loadings of revenue freight in the fourth quarter as compared with a year ago. It's significant to point out where some of these declines, by specific commodity, are expected to occur.

Starting to Show—Iron and steel loadings will be down 6.3 pct; other metals 3.4 pct; machinery and boilers, 1.8 pct; automobiles and trucks, 12.8 pct.

What About Next Year?

Not All Bad—This does not mean that serious times are ahead, broadly speaking. Business in the past three years has become accustomed to measuring conditions in terms of rate of increase, now looks with alarm at leveling off.

The evidence indicates that the current plateau will extend for more than a few months, perhaps well into 1958, with no appreciable rise. But there are a few imponderables.

What About Sputnik — Most significant, of course, is the effect of the Russian satellite on our Defense Dept. plans. Although there was no immediate indication of any change in overall spending, it's logical that the public will look favorably, even demand, some stepped up activity in missiles.

Whether this will have any immediate effect on business in general is debatable. If some missile, or missiles, do test out or live up to preliminary tests, they could be put into immediate mass production.

For R and D—Up to this point, however, missile spending, great as it is, is mostly confined to research and development and is not translated into metalworking production. The turning point may be at hand.

Despite all the talk of economy, government spending continues high at state and local, as well as national, levels. The roadbuilding program, which to date has disappointed builders of roadbuilding equipment, is about to get into full swing.

Metalworking Jobs Take Slight Dip

Hits Paychecks—Some of the leveling is apparent in the employment picture.

The Dept. of Labor reports: "In contrast to the persistent month-to-month employment gains registered in non-manufacturing activities, manufacturing employment has shown small declines, on a seasonally adjusted basis, since the beginning of 1957."

Jobs Decline—Factory jobs are reported to have declined by almost 280,000 since the first of the year, seasonally adjusted. About two-thirds of the decline occurred in the durable goods industries.

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For the man who says he "can't wear safety shoes"—try Genuine Kangaroo! It's plenty rugged for all ordinary wear and service, soft enough to pamper the tenderest feet—a favorite for over half a century in shoes built for comfort exclusively. And of course it includes the famous Lehigh Lockrim steel toe cap built to withstand impacts UP TO A TON!

FREE upon request on your company letterhead: display poster 17E showing 95 other styles in safety shoes for every industrial need.

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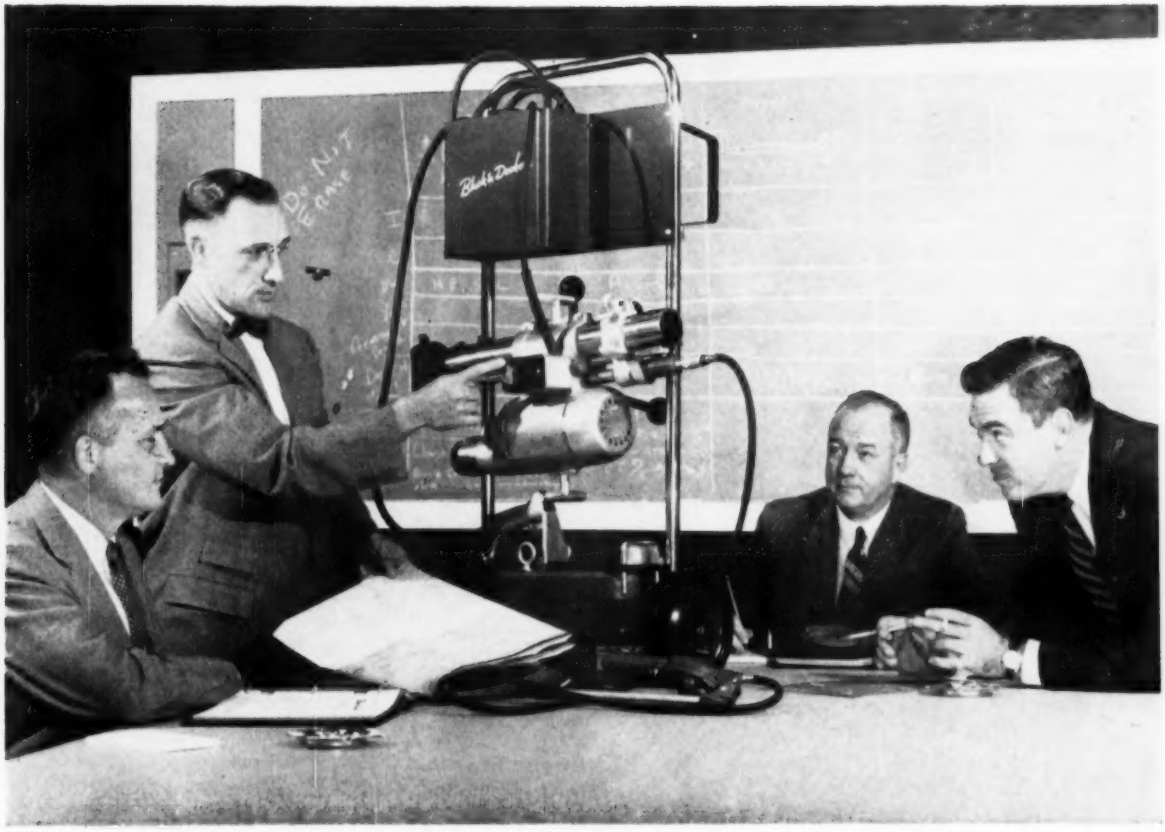


For details on photo see p. 88.

How To Plan New Products

New product development is as old as business itself. But present day competition compels management to think about this phase of business with new emphasis and urgency.

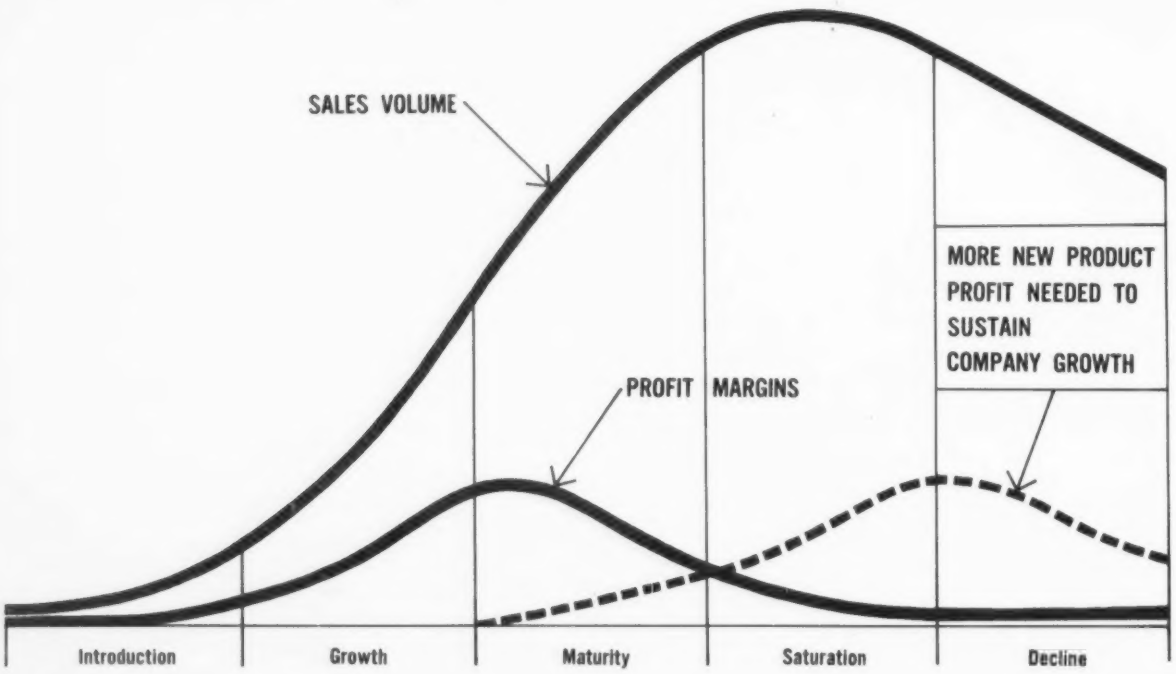
The proper management of new products has been under intensive study by the Management Research Dept. of Booz, Allen and Hamilton for the past two years.

This article is based on the highlights of the management firm's findings. It does not try to offer a tailor-made program.

Rather, it seeks to develop the significant principles and guideposts for new product development, which every manager should find useful in his own company planning.

Research material for this special survey report comes from a great variety of sources: More than 300 client case studies dealing with some phase of new product activity—Formal interviews with 40 leading manufacturers and 20 professional associations—New product data collected from more than 400 other manufacturers.

LIFE CYCLE OF NEW PRODUCTS



Take Six Basic Steps For Better

New product selection and development is a complex job. Even the largest companies have no sure-fire formula.

But firms with a systematic program get the best results.

There are roughly six stages through which all new product ideas should pass. They can be used as control or check points. —By Conrad Jones.

▪ The metalworking industry is staking a big part of its future on the success of products now just in the "idea" or development stage.

Research spending in the metals fields is running at a $4.5 billion a year pace and now accounts for more than half the total expenditures for all industrial research. By 1960, this outlay is expected to reach a level of at least $6 billion a year.

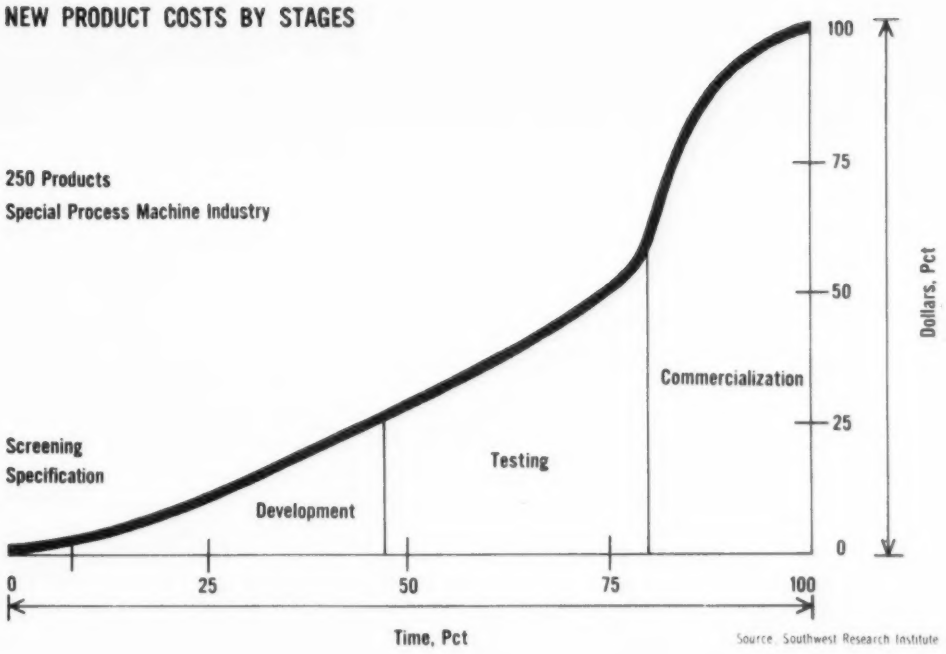
The research going into new metal products of all kinds, from machine tools, jet engines and electronic computers to bottle caps and zippers, is absorbing the time and energies of more than 140,000 engineers and other scientific professionals, not counting thousands of supporting workers of lesser skills.

Threaten Profit Life—These tremendous money and manpower commitments pose a continuing threat to the present product lines of nearly every company. They insure that most existing products in time will be superseded. What's more, that all too brief period of maximum profit in a product's life span — before the competition catches up—is being drastically shortened.

This means that if a company is to prosper or even survive, it must adopt as a business strategy some form of systematic program for the progressive introduction of new and improved products.

Whether by internal development or by company acquisition, new product management is a complex activity. Failure rates are high, particularly for smaller companies that can least afford it. The Dept. of Commerce figures that 90 pct of all new products fail within four years. Even the largest and most respected companies have no sure-fire success formula.

System Pays Off—However, the record shows that companies that



Product Planning

▪ Conrad Jones is a partner and manager of new product planning for the management consulting firm of Booz, Allen and Hamilton, Chicago.

His consulting experience covers a wide range of marketing and engineering assignments for some of the nation's largest companies.

In addition to his consulting assignments, he directed the firm's two-year research study on new product principles and practices.

He summarizes the findings in this article.

have worked out a systematic program of control and direction for their new product efforts have been able to achieve much better results. (Forty that we selected for special study have a five-year sales growth twice the national average.)

A new product development process contains six fairly definable stages through which all product ideas logically should pass and which can be used, therefore, as control or check points:

1. Exploration—The search for product ideas to meet company objectives.

2. Screening—A quick analysis to determine which ideas are pertinent and should be given careful examination.

3. Specifications — The expansion of the idea, through creative analysis, into concrete business recommendations of the product's features and its future program.

4. Development — Turning the idea-on-paper into a product-in-hand, producible and demonstrable.

5. Testing—The commercial experiments necessary to prove or disprove earlier judgments of its worth.

6. Commercialization — Launching the product in full-scale production and sale, committing the company's reputation and its resources.

Exploration

Exploration is a program in itself, having three basic steps: (a) determining the product fields of primary interest to the company; (b) establishing a program for

planned idea generation; and (c) collecting ideas through an organized network.

The first step in exploration involves analyzing company problems and defining the type of products that could meet these challenges; evaluating what the company is really good at—its proved and potential competitive advantages—and then setting down what must be done to capitalize on these existing resources; identifying explosive markets, technological breakthroughs, or fields of advancing profits, and then listing possible methods of exploiting these external growth opportunities.

Collect Ideas — Secondly, exploration calls for transmitting what top management has determined to be fields of interest to your creative people and departments—and setting goals and limits for them. After all, they can be just as creative within the bounds of company interest as they can "all over the landscape."

Finally, the ideas must be collected systematically. Most companies are filled with "floating ideas" that have never been brought down to earth.

Another source of product ideas is external. Although the days of the itinerant inventor who comes along and drops a fortune-producing idea in your lap are no more, many companies, especially in metalworking, can derive many product ideas from their suppliers and customers.

Review Old Products — Along with exploration work on new products, there should be a continuing review of the performance of your old ones. This periodic review should be directed toward the elimination of low-volume, relatively unprofitable lines.

Screening

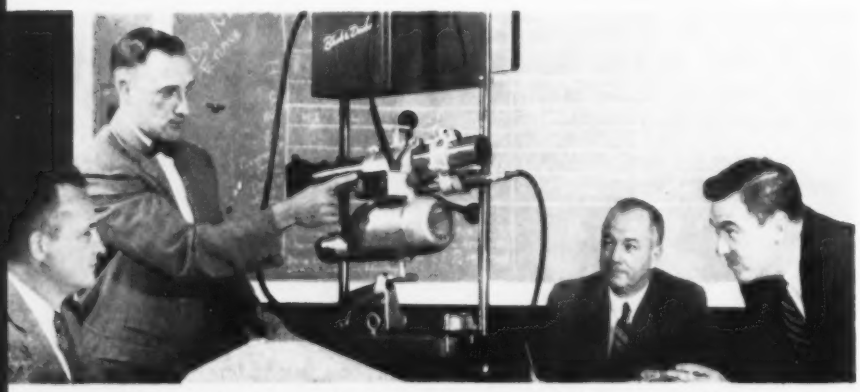
One company that we know of with an annual volume of about $40 million eliminated 16 different products whose sales added up to $3.3 million. In the next three years the company's sales increased 50 pct and its profits were increased approximately 20 times.

Most new product ideas arriving at the screening stage are still fragmentary and are not yet expressed in business terms. You must convert the idea into a business "proposition" and prepare a written description. Try to identify and list the most important business implications of the idea.

The single most important criterion, of course, is the potential; you then apply other yardsticks—competition, distribution pattern, manufacturing fit, capital requirements, etc.—mainly in an attempt to assess the possible risk.

Make Fast Decisions—This is the stage for "quick and dirty" research, a first cut. The screeners are not making a decision to do something. They can pass judgment on practical and impractical ideas very speedily. The reference tools here are phone calls, informal chats with company specialists, and the basic industry reference books. Hold the investigation down to a minimum. Two hours to two days per idea is about the range.

Well managed firms generally follow the practice of categorizing and filing every idea, even the ones discarded. Conditions change. Four or five years later the company might profitably come back to it.



■ **New Product Team: This week's cover photo shows some of Black & Decker Mfg. Co.'s new product team looking at the results of one of its latest efforts. It's a 1¼-in. portable magnetic drill press designed for continuous operation on AC or DC current. Its two-piece construction eases handling.**

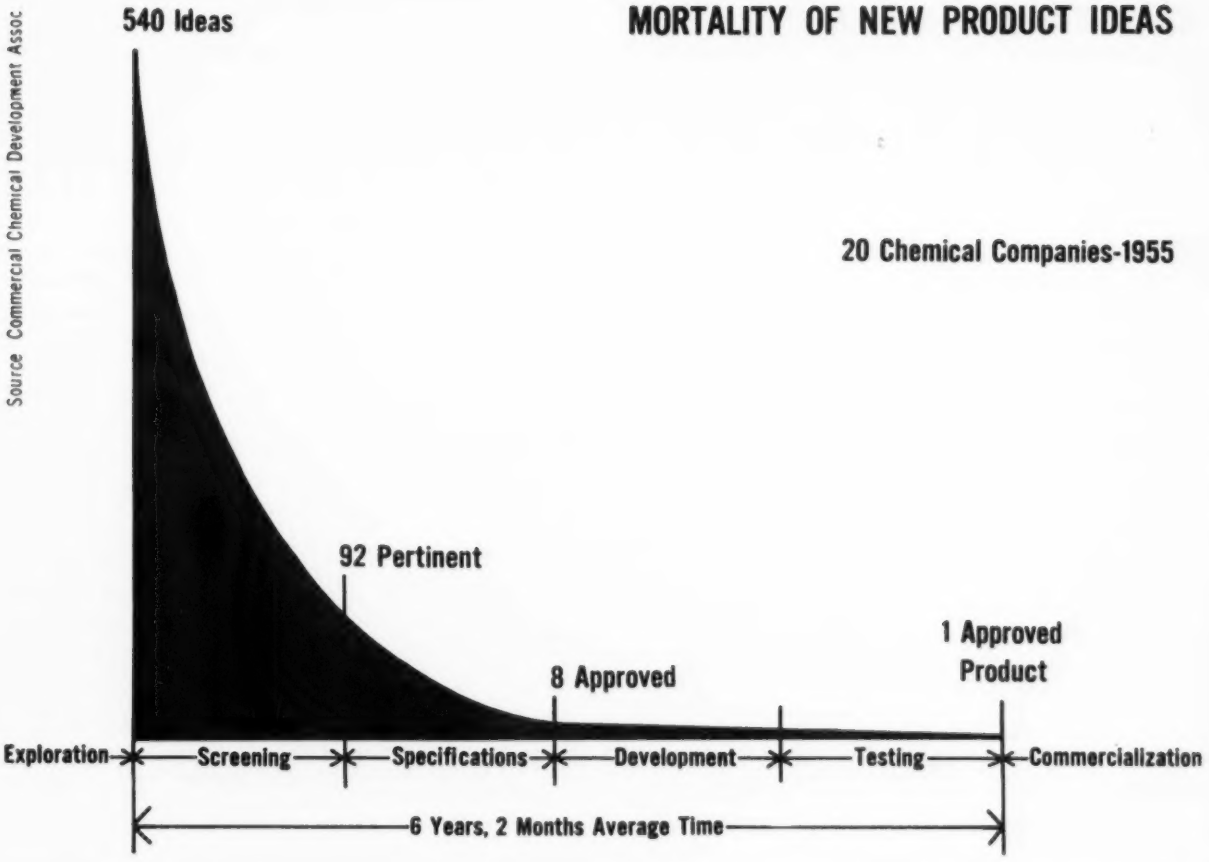
Guiding it through its two years of development were (l. to r.): A. J. Quick, Vice Pres.—Production; G. W. McCarty, Chief Engineer; A. S. Boehm, Industrial-Automotive Sales Mgr.; G. H. Porter, Adv. Mgr. Industrial - Automotive Div. and (not shown) R. C. Wells, Mgr. of Market Research Dept.

Specifications

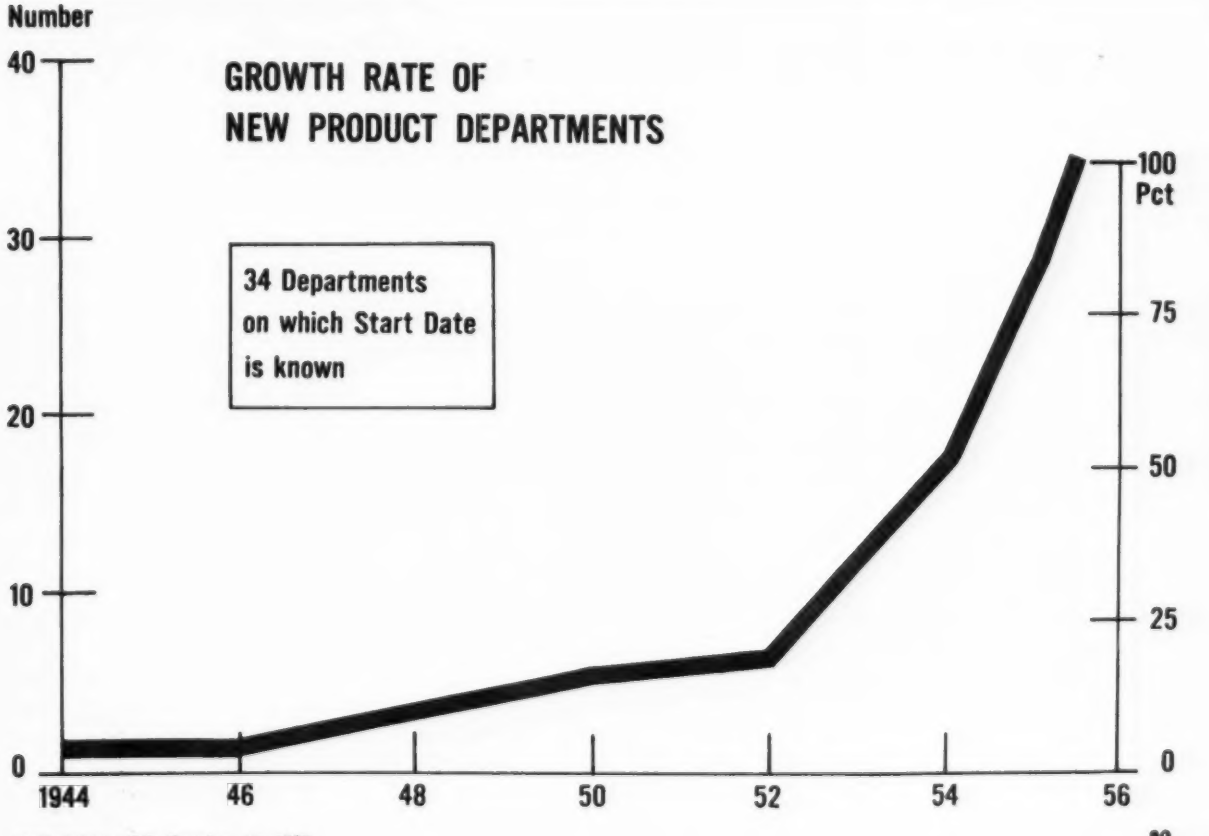
In setting up the specifications for a new product, first determine its desirable market features. What characteristics does it need to make it sell? Appraise the competition, existing and potential. Rank the specific features desired to give the product "appeal."

Just because your competition has a product of a certain type, it doesn't necessarily follow that you should follow suit. A major lesson that has been learned through harsh experience by most new product executives is: No "me-too" products. As one official puts it, "You may be able to make a buck or two on a me-too product, but it is a darn hard way to make a living." The characteristics that you impose on your product now will largely determine whether it

MORTALITY OF NEW PRODUCT IDEAS



GROWTH RATE OF NEW PRODUCT DEPARTMENTS



will be your best friend or your worst enemy later on.

Resolve Conflicts—Establish the feasibility of developing and manufacturing a product with these features. There will usually be a conflict between "feasibility" and "marketability." This conflict must be reconciled before you move ahead, or your new product has died here. And this is a good stage to let it die, because so far your monetary backing is negligible. Also, you can let an idea reside in this stage for a long time without its costing you either much manpower or money.

However, the costly part is about to begin. Some preliminary research and development work is usually indicated about now. This, however, does not mean a formal project. Dollar limits are usually set on the experimental work and are usually in the range of $1000 to $2000. Some companies we know of set limits as low as $200 while the range in others goes as high as $10,000.

Set Schedules—The final step at this stage is to establish product priority schedules and budgets. Establish a time table and estimate the expenditures for succeeding stages. Summarize the key data in presentable form, suitable for presentation to top management. The idea, at this stage must be transformed into a fairly concrete business recommendation, for the most costly stage is just ahead and it will be necessary to get full management approval.

Development

In the development stage of a new product you should explode the proposal into as many separate projects as are required for administrative control. Organize a team of company personnel with contingent responsibility.

Pinpoint further the responsibility of each team member and identify him in all reports and records. Sell each man on the importance of his project to his own self-interest. Establish yardsticks for measuring performance and progress.

Continue market studies as a check and as a basis for enhancing salability. Hold to the agreed specifications, or make formal revision by going back for management approval. Actually, there is quite a bit of recycling at this point back to the specifications stage, since research people are not renowned for staying docilely within rigid administrative boundaries.

Keep top management informed and report promptly anticipated changes in either the time schedule or the budget.

Let Project Go—Complete the laboratory evaluation, and release for testing. Testing here means in terms of commercial rather than technical standards. This may take a bit of prying loose, since research

Organizing For New Products

■ "New product" or "product planning" departments in growing numbers are showing up on organization charts these days. In fact, they are virtually the first new corporate appendages since the rise of the personnel department about 20 years ago.

These new departments report either to the chief executive of the company, to the top resarch and development officer, or to the top marketing officer.

Start Small—Most of these new units are small, consisting of from one to eight people, although International Business Machines provides the exception with more than 200. In their evolution, the first specialist to appear is usually a market researcher, the next a scientist, and, finally, an administrator to serve as "cop on the beat" and keep the operations straight and on paper.

The functions of these new departments vary from company to company. They are still too new for any common patterns to develop. They r e c o m m e n d new product objectives and programs; Plan exploration activities; Make screening decisions; Develop specifications; Recommend the development of new products; Investigate acquisition of other companies; Coordinate testing and pre-commercialization activities; and direct interdepartmental teams in all stages.

Staff Function — The new products department is strictly a staff function. The real work is done by product teams and task forces drawn from all departments of the company. Through this means, the new product department is able to achieve vast multiplication of its efforts. The various coordinated teams follow through on their individual projects throughout the development life history.

A new product department is not necessarily the best answer for every company. In many small companies this activity is still performed by the president himself; in others, by the company's executive committee. In some companies it is a one man job—that of a "new product director."

Pattern Develops — In large multi-division companies, we find a pattern developing of new product departments at two levels: each product division has such a depart-

people have a tendency to hold onto a development project in order to attain perfection long after the point where it could have been commercially exploited.

Testing

Now, at last, the product is in fairly final form.

The importance of market testing cannot be overemphasized.

In one study by the American Marketing Assoc., the experience of 210 companies that had introduced 1700 new products in the three years between 1953 and 1955 was analyzed. Products that were brought to market without prior market research experienced four times the number of "flops" of pretested products.

Set up standards for judging the product's performance and market acceptance. Identify the major points that must be proved out before commercialization. Plan the methods, schedule and costs for the tests needed for verification. Get management approval of the product concept, the test methods, schedule, and budget.

Get User Reaction—Conduct in-use, production and market tests. Design and test the production facilities. Continue laboratory testing. Don't forget to submit the products to a sampling of actual customers for "abuse" testing.

Although the people in the laboratory may tell you that there are no "bugs" in a product, you will never know until it is in the hands of a typical consumer, who traditionally disdains reading even the slightest line of an instruction manual or tag. This way you can find out how much abuse your baby product can really take.

Freeze Design—Make the final product decision. Freeze the design. Interpret the test findings objectively. Drop or modify products which fail tests. This, of course, is easier said than done. By this time, a considerable amount of money already has been spent on the product. One characteristic of new products as they go through development is that they become progressively harder to kill.

Incorporate the test findings in product design and commercialization plans. Detail the program for full-scale production and sales, with schedules, budgets, and manpower. Recommend the product and its commercialization program, with full supporting data, to top management for final product decision.

Commercialization

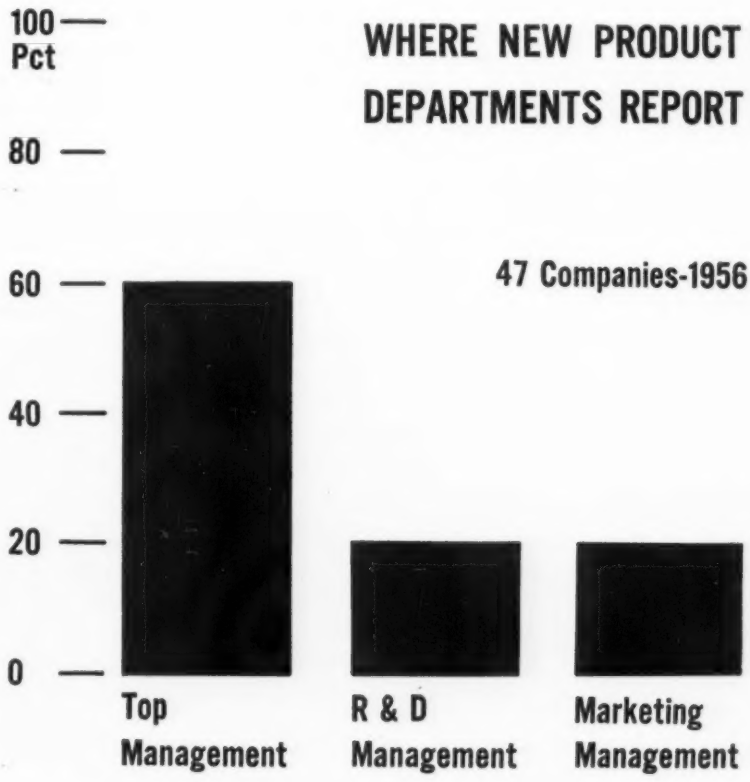
Here you complete the final plans for production and marketing. Establish an organization and set control for overall direction and coordination of the program. Designate responsibility for the program element. Fill in all program details to fit the coordinated plan.

Initiate the production and selling programs. Brief all participat-

ment to carry on work within the framework of the division's own technology and markets, and there is also a corporate department whose function is not only company-wide coordination, but of spawning further new divisions.

Shot Cut—The creation of a new product department in no way infringes on the decision-making responsibility of top management. It must still determine company objectives; approve or disprove further action on a new product at each stage of its development; and conduct final negotiations for the acquisition of new companies.

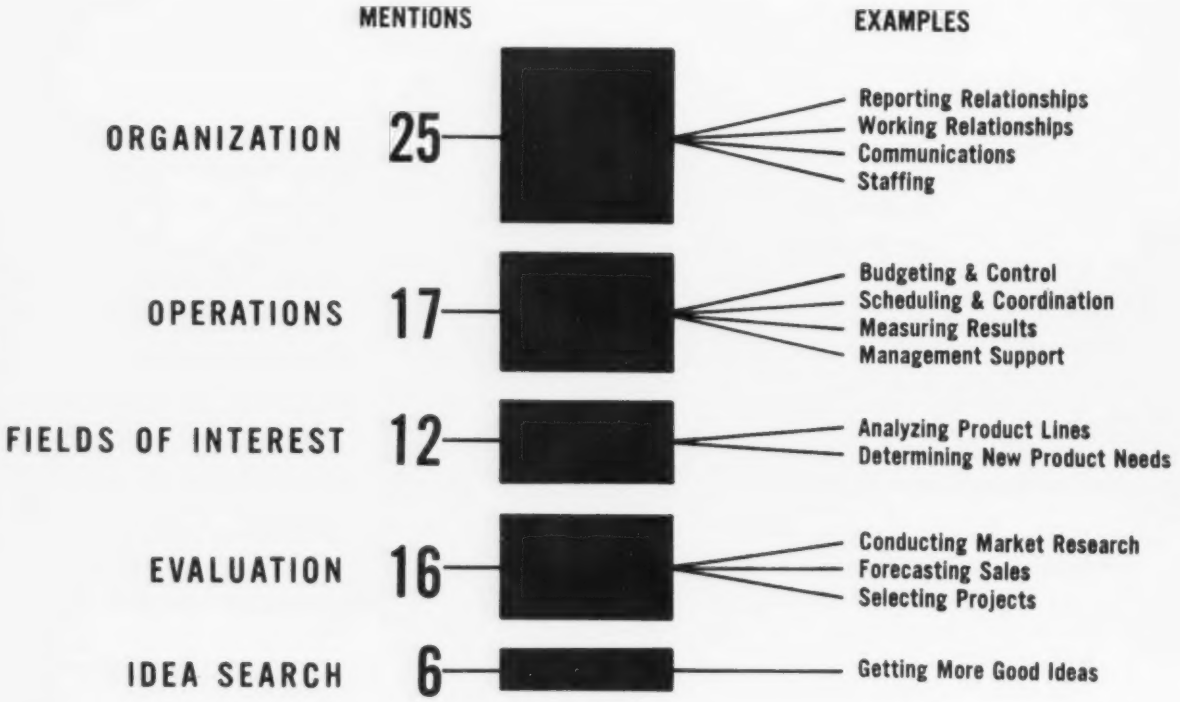
One short cut in new product development is to get them "ready made" through mergers or company acquisitions. Metalworking has made broad use of them. In one seven-year period, 494 metalworking companies in machinery, fabricated metals, transportation equipment, electrical machinery and primary metals took over 805 other major firms.



The success of Sterling's No. 2 Chuck

PROBLEMS OF NEW PRODUCT EXECUTIVES

In 40 Companies



ing personnel. Maintain an established program sequence and schedule. Provide feed-back mechanisms for program corrections.

Keep Team Intact—Check the results. Make design changes promptly to correct "bugs." Shape the product program to meet changing competitive and internal pressures. Work continuously for cost reduction and quality control. Maintain the necessary team members until the product is a "going" commercial success.

Commercialization costs and methods, of course, differ radically, according to the type of product. Generally speaking consumer goods are far more expensive in this stage than capital goods. Frequently you have to "buy into" the market, spending millions in advertising, marketing and distribution.

Although there are six basic stages in new product planning the spotlight should be beamed most brightly on the first three—exploration, screening and specifications—because these are the areas where there is the most room for improvement.

A company adequately financed and well managed has little reason to expect failure in the commercialization stage. Slip-ups take place a lot farther back in the process.

Development Costs More—The testing stage is the place to experience some of these failures. Yet, far too many products manage to survive to this stage, after expensive development work, only to be killed for non-technical reasons that easily could have been anticipated.

Development, itself, is rarely a major problem, at least with the larger companies.

However, the costs of development work are making themselves felt, with increasingly painful impact. The bidding up of salaries of technical professionals and the huge outlays required for equipment are constantly raising the dollar penalty of poor judgment in earlier product screening. Development costs have been increasing at a rate of 5 pct a year.

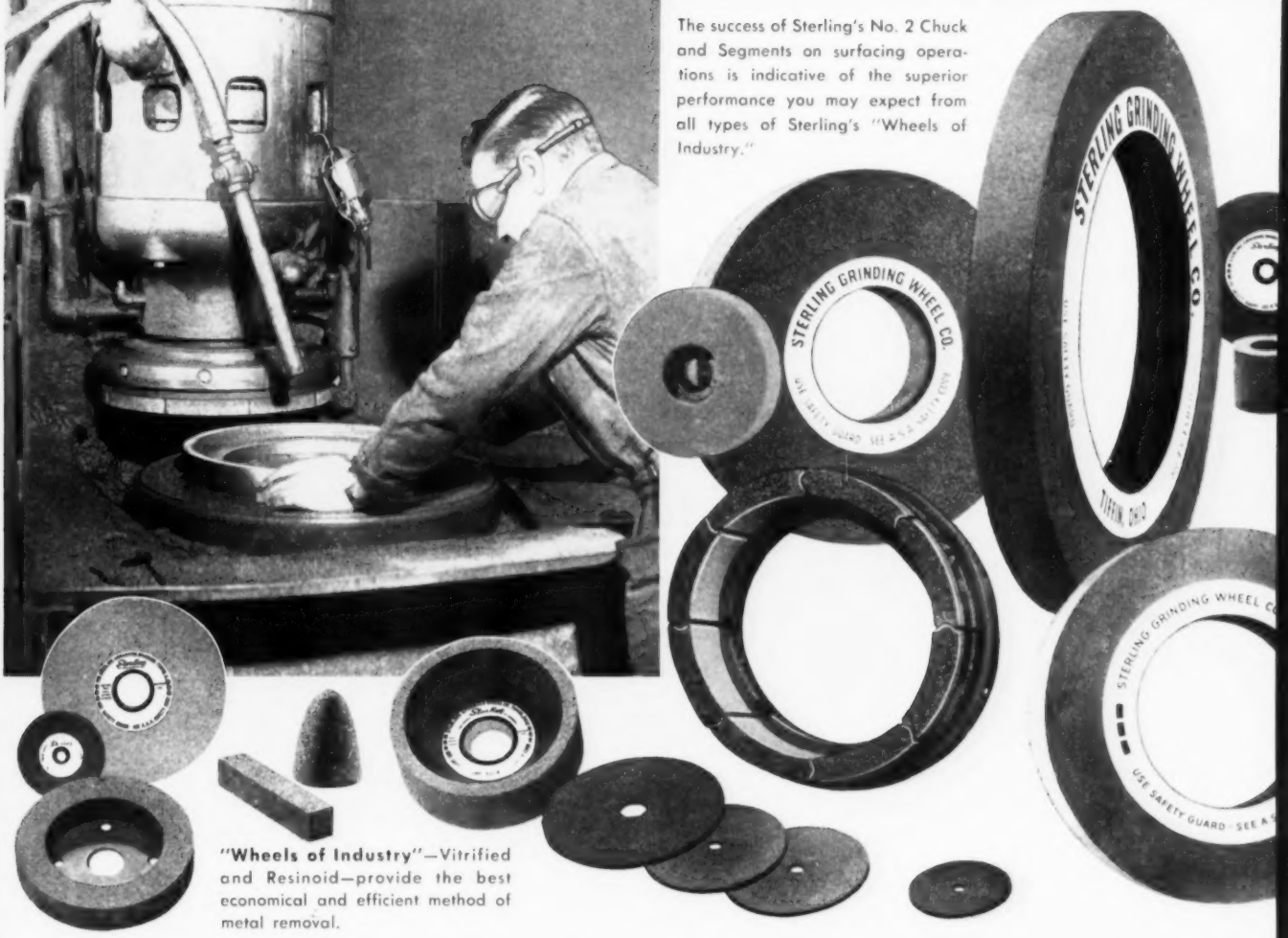
Market Research Grows — Increasing emphasis is being put on market research at nearly every step in new product development programs.

Problems of selling a product usually are more numerous and exacting than the problems of how to make it. Thus, market research investigations are being pushed farther and farther back into the planning and screening stages, to head off costly wastes of money and manpower later.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

AUTOMOTIVE

The success of Sterling's No. 2 Chuck and Segments on surfacing operations is indicative of the superior performance you may expect from all types of Sterling's "Wheels of Industry."



"Wheels of Industry"—Vitrified and Resinoid—provide the best economical and efficient method of metal removal.

Sterling's "sixth element" grinding wheels provide assurance of positive job results

STERLING EMPLOYS a new element in its "Wheels of Industry." Added to the usual group of five—abrasive, grain size, grade, structure, bond—is a new *sixth element*—the *human* element. Thus, Sterling offers an important "extra" that makes its wheels better.

The sixth element is based upon the reactions of the operator to the varying demands of his job—how the strength or ease with which he applies the work to the wheel affects grinding efficiency and thereby changes wheel specifications. How his preferences can be met by building a special wheel—that's the *sixth element* in action . . . the *human* element that results in every Sterling grinding unit being tailor-made whenever necessary.

Unusual study of the *sixth element* is an everyday assignment for Sterling abrasive engineers or representatives of our well-stocked distributors. The addition of the *human* element to Sterling's "Wheels of Industry" slows down costs, speeds up production. This successful application of the *sixth element* needs only a meeting of minds—yours and ours. No obligation, of course. Write, wire, or phone us today.

STERLING GRINDING WHEELS

"THE WHEELS OF INDUSTRY" STERLING

STERLING GRINDING WHEEL CO., TIFFIN, OHIO—SUBSIDIARY OF ABRASIVE AND METAL PRODUCTS COMPANY

Distributors and Direct Representatives Located in All Principal Cities

1958—Year of Decision for AMC

Romney Confident His Company Will Show a Profit

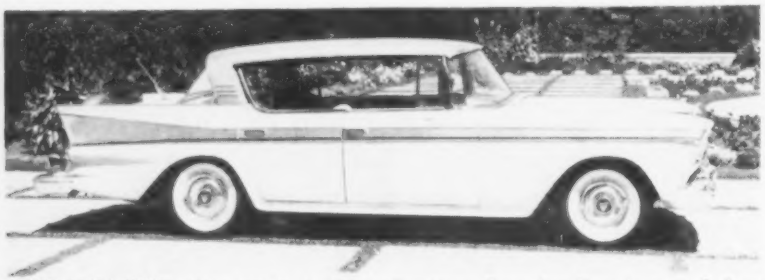
American Motors is going all out to sell 180,000 cars next year—3 pct of the market.

Big changes have been made. Nash and Hudson are dropped. The Ambassador arrives. Metropolitan gets bigger play.—By H. R. Neal.

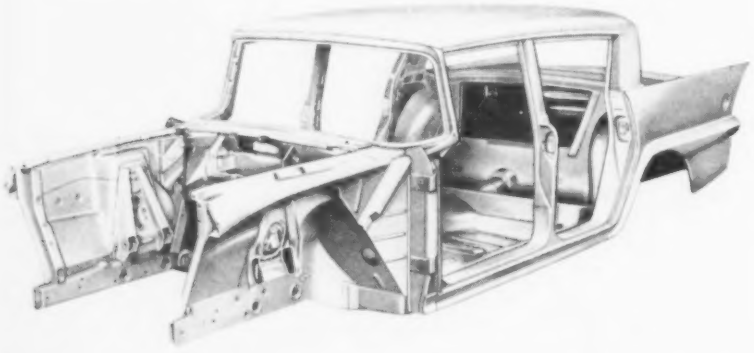
■ There are no two ways about it. 1958 is the "make or break" year for American Motors Corp. If there were any lingering doubts about this, AMC president George Romney removed them a few weeks back. "We can't lose money in 1958 and stay in the automobile business," is the way he put it to AMC automotive division employees at the start of 1958 model production.

Mr. Romney is confident his company will be doing business in automobiles for some years to come. Such confidence has not been gained easily. Sizable losses have been the steady bill of fare since the formation of AMC in 1954 through the merger of Nash and Hudson. The firm's 1956-57 fiscal report is being written in red ink. What magic will turn the fluid in the inkwell to black?

Variety of Sizes—The 1958 line of AMC cars has undergone some remarkable changes. Name leaders of the line, Nash 1917 and Hudson 1909, have been junked completely. Rambler, sales leader for the past several years, dominates the entire 1958 line of cars—all other AMC cars evolve from this restyled vehicle. A "senior" car has been added to the automotive line. A "small" car, dropped from production in 1954, has been revived. Success of "foreign" imports will strengthen AMC's Metropolitan.



AMBASSADOR: The 1958 Ambassador four-door hardtop is a scaled-up version of the Rambler. It is powered by a 270 hp V-8 engine.



UNIT BODY: More than 9000 welds are used to produce the single-unit body, hallmark of American Motors cars. It eliminates need for frame.

The Rambler is the middle size car of the line. Its 108 in. wheelbase is about midway between the senior and small cars. AMC refers to it as a "compact" car. Styling changes have been made—more than found on some makes; not as many as others. Certainly, it is not "all new."

Improved Engines—The Rambler will be powered by a six- cylinder, OHV 127 hp engine. An optional twin-throat carburetor boosts the rating to 138 hp. Models with a V-8 engine will be known as the Rambler Rebel. The V-8 develops 215 hp, up from last year's 190.

In 1957 the name "Rebel" was to designate a Rambler equipped with fuel injection. As was the case elsewhere, fuel injection was talked about but little more ever developed. It won't even be talked about at AMC in 1958.

Enter, Ambassador—Something that will be talked about, however, is the new Ambassador or "senior" car. It is the first "new" car to be introduced since the formation of American Motors. The name Ambassador is all that remains of either the Nash or Hudson names. It is certain to be unique in at least

from: Metal & Thermit to: The IDEA Minded

New type chromium plate solves corrosion problems

Hydraulic piston rods plated with Unichrome Crack-Free Chromium by Bendix Products Division for their popular power steering mechanisms are helping to make driving safer and easier than ever. This innovation by Bendix provides increased protection against wear, corrosion, and hydraulic leaks.

Compared to ordinary chromium, Unichrome Crack-Free Chromium, developed by Metal & Thermit, stands out on resistance to corrosion, thermal shock, wear, and prevention of hydraulic fluid loss.

Costs little to brighten up sales

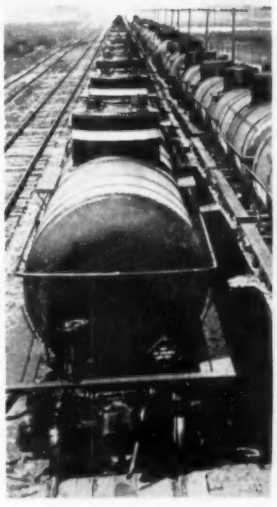
Given a choice, the customer always picks the brighter product. That's one good reason to consider two newly developed Unichrome Dips that produce bright chrome-like finishes on zinc plated or galvanized products. Extreme economy is another. Costs for these dip compounds range between 30¢ and 60¢ per 1000 sq. ft. of surface treated. They're increasing shelf life and sales appeal of even the most competitively priced products . . . such as toy wheels, electrical conduit and boxes, and rough hardware.

Tank car turnaround costs less

"Very good", reported the inspector at a large chemical company. He was examining the interior of one of their tank cars coated with Unichrome Lining B-124. Twenty-two trips in contact with highly corrosive 92% phenol left little mark on the protective coating.

Companies using tank cars or tanks can benefit from this experience. With skilled firms in key locations now available to apply linings to open or closed tanks, no company has to forego the maintenance-saving, cost-cutting protection of enduring Unichrome Tank and Drum Linings.

About ORGANIC COATINGS



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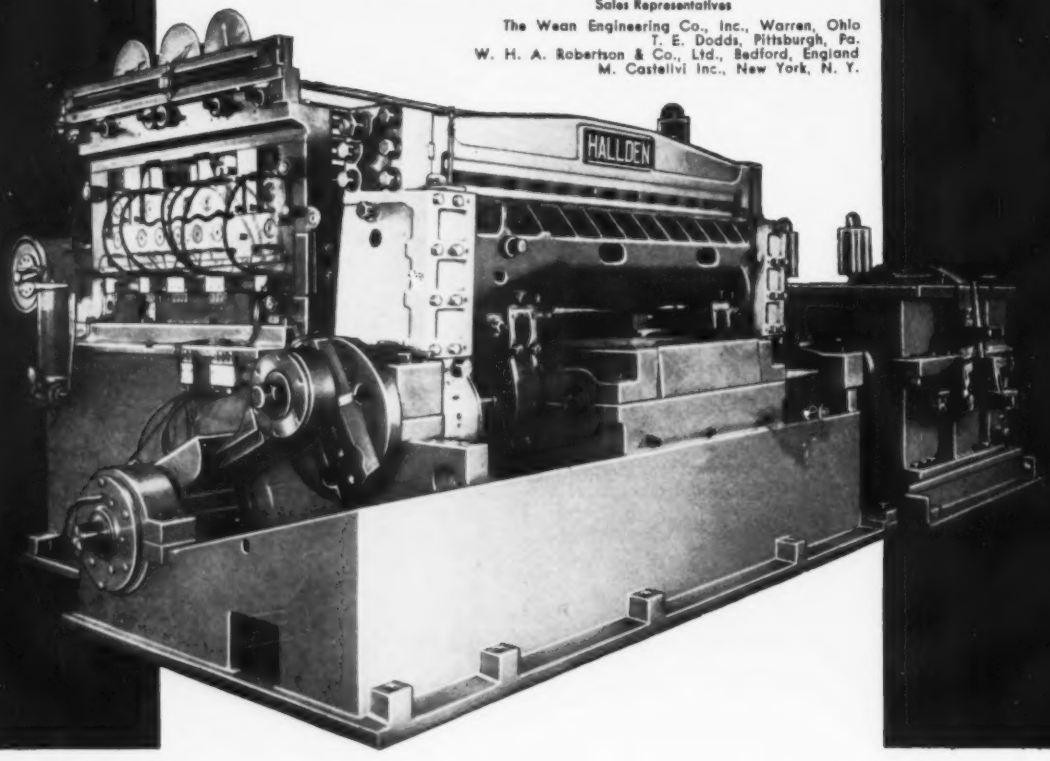


Automotive Production

WEEK ENDING	CARS	TRUCKS
Oct. 12, 1957*	37,999	18,763
Oct. 5, 1957	21,975	11,678
Oct. 13, 1956	70,175	21,028
Oct. 6, 1956	59,367	19,926
TO DATE 1957	4,731,600	844,200
TO DATE 1956	4,358,553	877,067

*Preliminary Source: Ward's Reports

one aspect—it is a "scaled up" model of a smaller car.

Ambassador models will share the Rambler body shell and the compact car's styling and engineering features. Wheelbase of the new car is considerably greater at 117 in., nine in. more than the Rambler.

The line includes a super and custom four-door sedan and four-door station wagon, and a custom four-door hardtop sedan and four-door hardtop station wagon.

Air Suspension Coming—Ambassadors are powered by a 270 hp V-8 engine equipped with a new four-barrel carburetor and full-flow oil filter. Considering both engine and vehicle size, AMC believes the power plant will deliver both performance and economy.

Later in the model year AMC plans to introduce an air-suspension system for the rear springs only. An AMC engineer explained they don't see any advantages to be gained from a front air-suspension unit at the present time.

Ambassador and Rambler models equipped with an automatic transmission employ a new push-button console. Five control buttons are grouped together at the far left of the instrument panel.

Emphasis on Economy — Economy is king at AMC. Mr. Romney is convinced car buyers are taking a second look at operating costs for their vehicles. Sales figures back him up with evidence of the growing popularity of his Rambler and the small imported Metropolitan. Economy-size foreign car sales add further evidence. If that isn't enough, many of the major car makers have suddenly emerged with engines and engineering improvements designed to improve operational economy of their products.

To make sure all of the bases are covered, AMC is bringing out the small 100 in. wheelbase car it discontinued a few model seasons back. The car was probably a year or two ahead of its time, but the booming little-car market should make it a success. It is now scheduled to go into production around Jan. 1, 1958.

With AMC's break-even point reduced to around 120,000 units, he will settle for 180,000 and three pct of the 1958 market. The two independent automakers combined produced 3.25 pct of the 1957 model cars.

GM Divisions Vie For Markets

Pontiac division of General Motors has set its goal for 1958—to take over fifth place in the industry. This should lead to an interesting sales battle within GM. Pontiac is now sixth in industry sales. Oldsmobile holds fifth; Buick fourth.

S. E. Knudsen, Pontiac general manager and GM vice president, is banking on his completely restyled and re-engineered car to pull the trick for him.

He predicted the auto industry would sell about six million cars, and Pontiac 480,000. "At Pontiac we are shooting for eight pct of the market," he said. At this point he runs headlong into the opposition of Pontiac's sister divisions.

Ditto, Olds and Buick—Oldsmobile's general manager, Jack F. Wolfram, has indicated his division is shooting for about the same share of the market, but 500,000 units. About 20,000 units behind Buick in 1957, he is casting an eye on the industry's fourth spot held by that car.

Buick's Edward T. Ragsdale has been more guarded in announcing plans to regain the third slot it lost this year. But Mr. Ragsdale served notice a while back Buick intends to get the identical share of the market the other two are after.

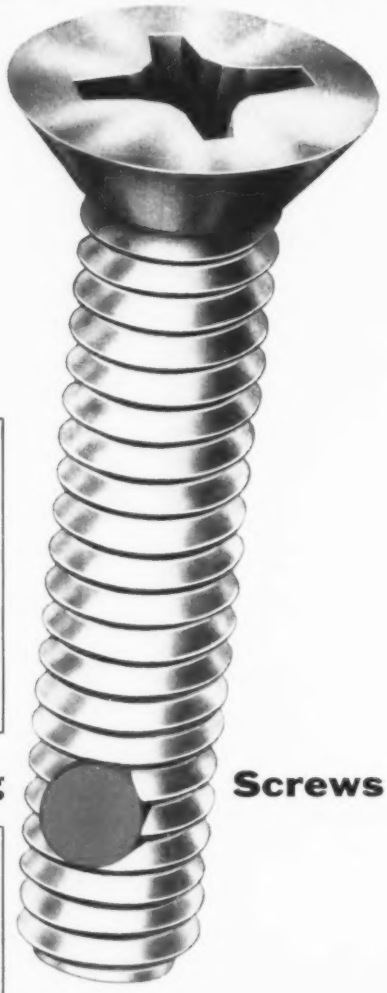
THE BULL OF THE WOODS By J. R. Williams

YOU ABSOLUTELY CAN'T BE HONEST! THAT GUY IS TOO HONEST TO SLEEP ON DUTY, BUT IS CROOKED ENOUGH TO BE LOOKOUT MAN FER TH' SLEEPERS-- SO HE CAN'T BE HONEST AN' BE AN ACCESSORY TO BREAKIN' RULES!
SURE YOU KIN! THERE'S NO RULE AGIN WAKIN' PEOPLE--HE'S JUST A GOOD GUY, AN' YOU KNOW WHUT A GOOD GUY IS--IT'S A GUY WHO GIVES ALL HIS TOBACCO AWAY, LOANS ALL HIS TOOLS, HELPS EVERYBODY, TURNS DOWN NOBODY, AN' FINALLY LANDS IN THE POORHOUSE--THAT'S A GOOD GUY!
THE GOOD GUY?
J.R.WILLIAMS
T.M. Reg. U.S. Pat. Off.
© 1957 by NEA Service, Inc.

Continental has the cure for vibration "headaches"

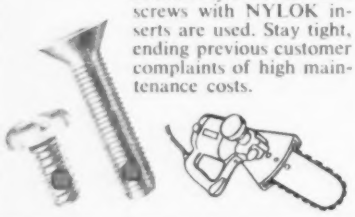
the one-piece locking screw that won't work loose

HOLTITE® NYLOK Screws and Bolts are one of the many progressive ideas in fasteners pioneered by Continental. These one-piece, self-locking fasteners with the Nylon insert eliminate the need for lock washers, jam nuts, wiring, and similar devices. If you have fastening problems (like the applications below), for which Nylok is the practical solution, you can start now to save assembly dollars, and give your product a definite competitive advantage.



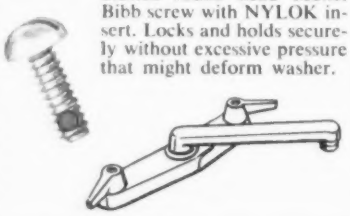
BEAT VIBRATION, KEEP CHAIN SAWS "ON THE JOB"

Several styles of machine screws with NYLOK inserts are used. Stay tight, ending previous customer complaints of high maintenance costs.



HOLD FAUCET WASHERS FIRMLY AT CORRECT ADJUSTMENT

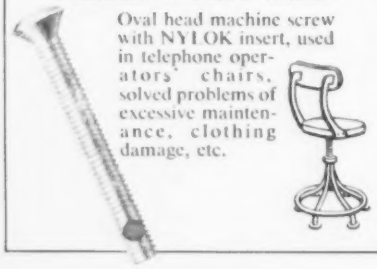
Slotted round head Monel Bibb screw with NYLOK insert. Locks and holds securely without excessive pressure that might deform washer.



HOLTITE® NYLOK® Self-locking Screws

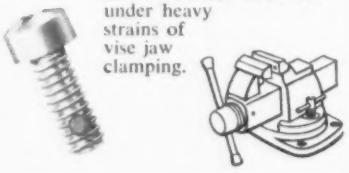
STAY TIGHT UNDER CONSTANT STRESSES IN METAL CHAIRS

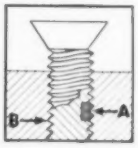
Oval head machine screw with NYLOK insert, used in telephone operators' chairs, solved problems of excessive maintenance, clothing damage, etc.



WITHSTAND REPEATED SHOCKS IN VISE JAW INSERTS

Phillips fillister head machine screw with NYLOK insert will not back out under heavy strains of vise jaw clamping.





HERE'S WHY HOLTITE NYLOK® LOCKS SECURELY

Resilient nylon plug (A) sets up a lateral thrust, smoothly wedges mating threads together (B). All locking action is on threads: head is not stressed. Locking is positive . . . seated or unseated.

CHECK YOUR ASSEMBLIES. Find out where Continental cost-saving ideas, like Nylok, can cut your assembly costs. Continental Assembly Specialists are fully qualified to analyze your operations and advise which fasteners — *standard or special* — can save you most. For prompt service, write or phone: Continental Screw Co., 450 Mt. Pleasant St., New Bedford, Mass.

One piece — no separate parts
Can be removed and replaced
Interchangeable — reusable
Locks seated or unseated
Acts as seal for gases, liquids

CONTINENTAL
HOLTITE FASTENERS

HOLTITE PHILLIPS AND SLOTTED HEAD
WOOD • MACHINE • TAPPING • THREAD CUTTING • SEMS • NYLOK
HY-PRO PHILLIPS INSERT BITS AND HOLDERS

Door Is Closed to Extra Funds

Emergency Requests Must Be Real Emergencies

Rep. Cannon warns agencies not to have their hands out for supplemental appropriations.

Economy is the word, he says, and apparently he means to enforce it.—By G. H. Baker.

■ The chairman of the powerful House Appropriations Committee is warning the White House not to expect the Congress to restore any of the funds cut out earlier this year. This grim warning comes from Rep. Clarence Cannon, D., Mo. More than any other man in the Congress, he controls the purse strings on government spending.

(When Cannon decides that any government agency has on hand all the money it needs, it is futile for that agency to ask for more.)

Emergency Money — In past years, it has become the fashion for government agencies that have borne budget cuts to submit supplemental budget requests to the Congress at later dates. Usually, the purpose of these supplemental requests is to achieve—by new claims of emergency or crisis—money that has already been denied by the Congress.

Cannon says flatly that unless the nation is drawn into war or runs into an unforeseen emergency, the Congress will provide no additional funds to operate any agency.

Who's Boss?—"If any governmental agency in its superior wisdom decides it knows more about that than Congress, it is in for a rude awakening. The country is demanding economy, and it is high time someone in Washington gave heed to that very reasonable demand," he declares.

And Cannon also warns the White House not to be so late next year in submitting its money requests for programs like foreign aid and military construction. This year, these programs were sent to the Congress late in the session and had to be rushed through at the last minute without proper examination or understanding, Cannon says.

Small Business Gets More Promises

Congressional leaders are promising to press anew for at least four measures next year to aid small business firms.

Heading the list is a bill, backed by the Administration, which would extend the right of accelerated depreciation to purchases of used production property. At present, this tax benefit is confined to new equipment.

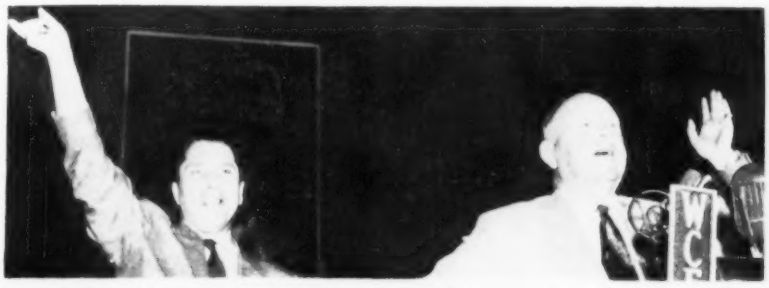
They are also supporting measures to permit small, closely-held corporations with 10 or fewer stockholders the right to be taxed as partnerships; to permit small firms to pay estate taxes over a 10-year period, rather than in the year the business is inherited; and to give investors in small firms more liberal tax treatment on stock losses.

All these measures were first suggested by the President's small business committee, and endorsed by the Administration. Democratic congressional leaders are also backing the measures, so the chance of passage is bright.

Tax Hearings Coming

Hearings to set the stage for possible cuts in income, excise, gift and estate taxes will open January 7, before the House Ways and Means Committee.

Unions: Clean Up—Or Else

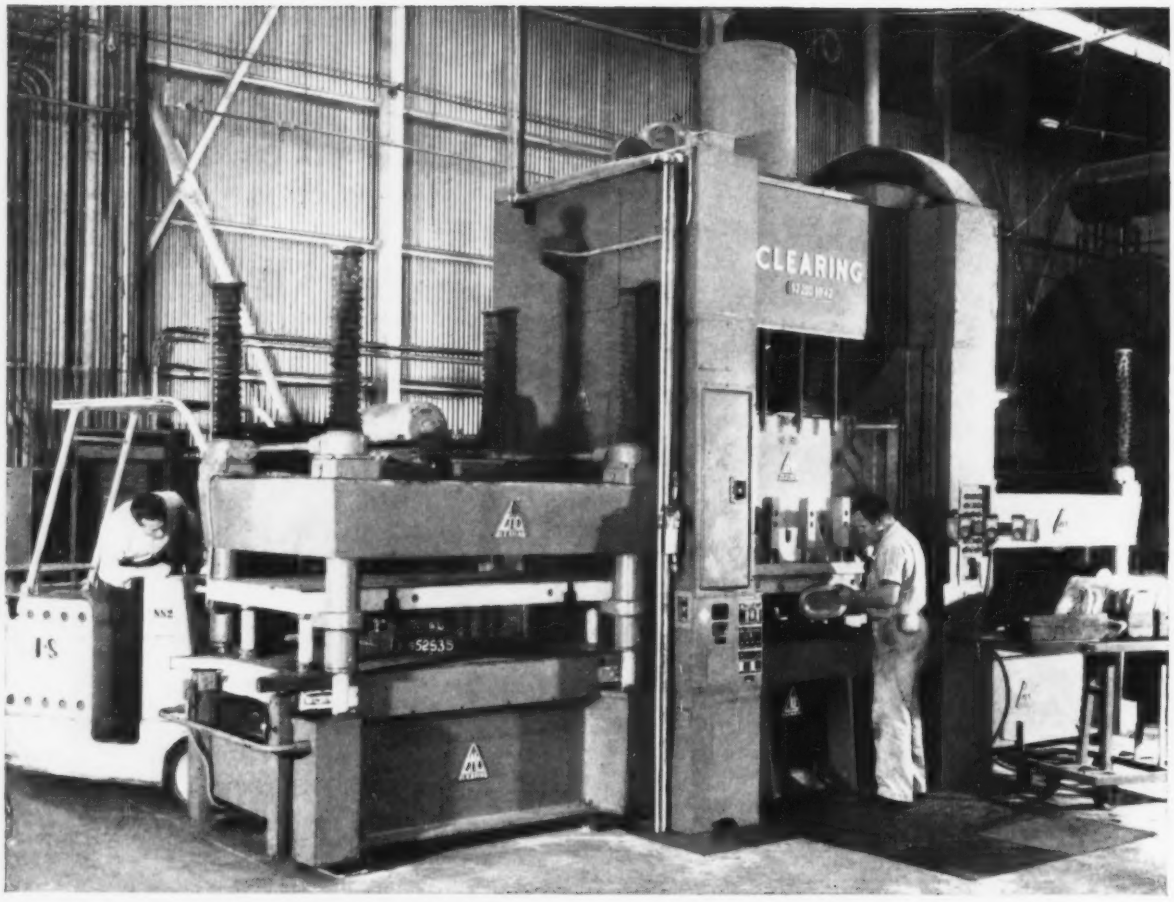


And Fast—The government's demand for cleaner unions has risen sharply in the wake of Jimmy Hoffa's election as president of the AFL-CIO Teamsters union.

Both Congress and the Executive branch have stepped up insistence that unions purge themselves of corrupt elements, and fast. Alternative is a compulsory housecleaning administered by far stricter labor laws.

Determined—The Senate rackets committee is more determined than ever to force cleanups, particularly of the Teamsters, now led by Hoffa, above, with outgoing Dave Beck.

At the U. S. Labor Dept., Secretary Mitchell declares he'll ask Congress to enact legislation



How North American Aviation plans continuous production of short runs with a CLEARING MOVING BOLSTER Press

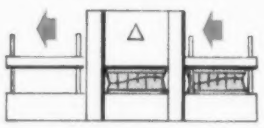
As you know, the aircraft industry needs a lot of short run stampings, and short runs can plague a production man because a lot of valuable time is eaten up in die setting. But here's the way Clearing has helped North American Aviation, Inc. lick that problem. The press above has a double bolster that can be automatically powered across the die area.

While one job is running, the next job is being set up *outside* the press. When you finish this production run, push a button and the dies are unclamped from the press slide. Another push button rolls the new dies into place under the slide. Clamp these in and start running. Now you can set the next job up on the other side of the press.

The device at right is another added feature. It's a die separator that makes it possible to open the dies for maintenance and inspection without tying up crane facilities.

Clearing moving bolster presses can be the answer for your company if you want to put more productive hours in a day. We have a folder prepared on "Push Button Die Setting." It's yours for the asking.

how it works



Dies are set up outside the press. When the current job is completed the bolster is traversed automatically to the right or left. Now the dies are in place for the next job. Slide clamps which hold the die to the slide are also engaged and disengaged automatically.

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION *division of* **U. S. INDUSTRIES, INC.**

6499 W. 65th STREET, CHICAGO 38, ILLINOIS • HAMILTON DIVISION, HAMILTON, OHIO

What's Ahead in Planemaking?

SAE Pinpoints Developments at Aeronautic Meeting

Here's what the engineers say to expect:

Around the world in less than a day is 10-20 years away.

Steel, titanium will be most used structural materials.

Market for equipment makers is expanding.—By R. R. Kay.

▪ Around the world in a day: We'll be doing this within twenty years, maybe even ten. Actual travel time might be only three hours.

This was some of the talk at the recent Society of Automotive Engineers National Aeronautic meeting, at Los Angeles.

Here are some highlights of the meeting.

As the Engineers See It — It looks as if steel and titanium will soon take the lead as airframe-structure materials. Cobalt or nickel-base "super alloys" are the big hope in the 1200°-1700°F range. Above that, molybdenum looks practical.

Lithium is the key to a new aluminum alloy — will maintain high strength to 400°F. It pushes the thermal barrier, which threatened the use of aluminum in supersonic aircraft, ahead more than 100°F (The IRON AGE, Oct. 10, p. 80).

Cost of tools and equipment to build tomorrow's planes will keep moving up.

Longer Life for Low-Alloy — Cadmium gives a longer life to low-alloy steels used in air-frames. Electrolytic coatings of the metal applied during the vacuum phase don't cause embrittlement.

Use of high-strength weldments in fabricating aircraft structures improves quality and performance at low cost. It permits design flexibility, and cuts machining time. It produces structures comparable in strength and weight to machined forgings, often at less expense.

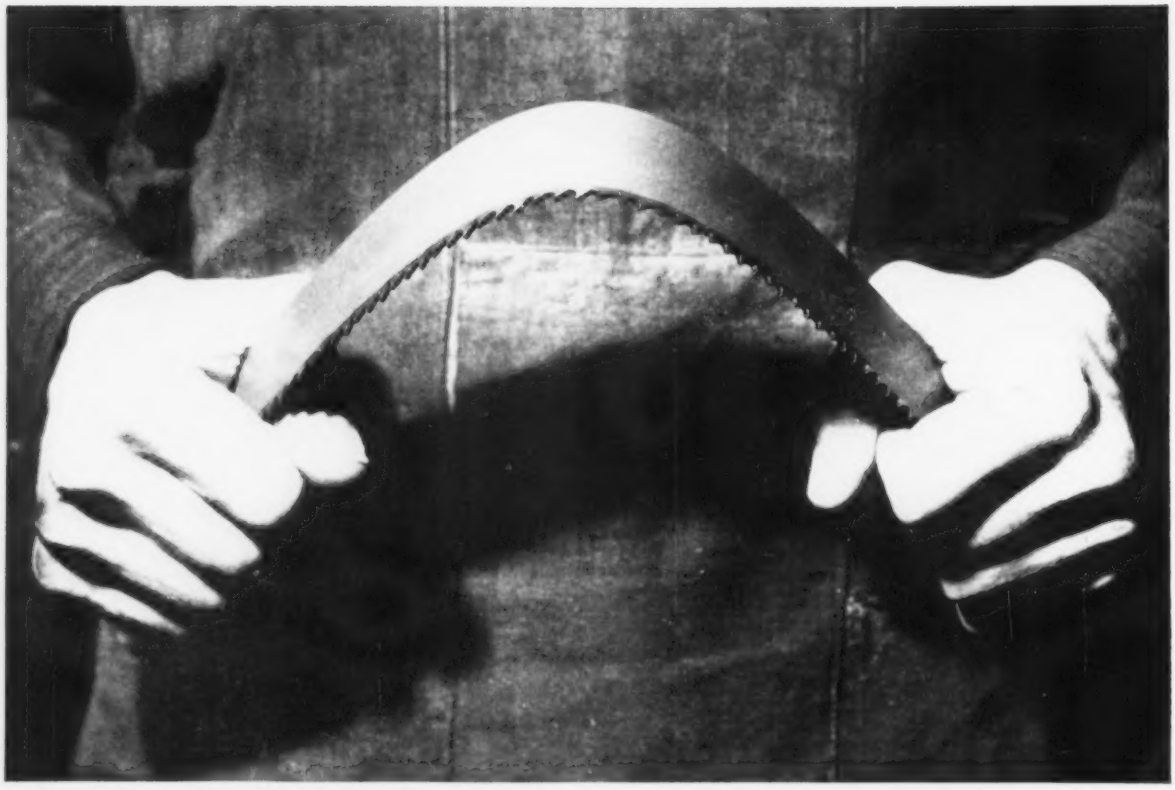
Trend to Low-Speed—There will be a real need for low-speed, more powerful machines, as the aircraft industry converts to high tensile materials. Many high-speed machines, now used on aluminum, won't convert for steel.

The future will be busy for equipment makers. Changes in materials will also call for new furnaces and heat treating.

No Atomic Planes Yet—Atomic-powered planes will be capable of unlimited range, high altitude, and supersonic speed. But chemical-type fuels will dominate the field for another 25 years.

From High Seas to Cross Country

SHIP-TO-SHORE: Gantry crane, with Wickwire rope from Colorado Fuel and Iron Corp., unloads 25-ton van-type truck bodies from tankers to trailer chassis in a Southern U. S. port.



THIS is No Ordinary Power Hack Saw Blade

This is the *unbreakable* MARVEL High-Speed-Edge Hack Saw Blade—the first bi-metal blade—invented, developed and introduced by MARVEL. This blade is a combination of two materials best suited to the requirements of an efficient hack saw blade . . . a narrow high speed steel cutting edge permanently welded to a tough, non-brittle alloy steel body. Each blade is triple tempered to assure long life and maximum toughness to the cutting edge. Development of this high-speed-edge blade made it possible to cut any kind of material from the free machining steels to the toughest of alloys, fast, accurately and economically. Just one type blade to handle any job — no switching blades to cut different materials. Like all good things, attempted copies of this blade have been numerous, but its performance has been *unequalled* by any of the imitators.

The MARVEL high-speed-edge hack saw blade can be tensioned from 200% to 300% tauter than any ordinary hack saw blade, a definite advantage which permits heavier feed pressures to be used without deflection or fear of breakage.

An extremely rugged cutting tool, this one type blade, the MARVEL High-Speed-Edge Hack Saw Blade, will cut any machineable metal with outstanding economy, accuracy, long life and complete safety—*it is unbreakable.*

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ODM Stiffens Tool Leasing Plan

Uniform Contract Terms Are Spelled Out

New arrangement is expected to nip criticism that large companies get the breaks in U. S. tool leasing program.

Rental rates won't undercut builders' business, officials claim. —By E. J. Egan, Jr.

■ If there ever was anything free and easy about private-industry leases of government-owned machine tools, those days are supposed to be gone forever.

Henceforth, Uncle Sam's equipment-rental contracts will have more strings on them than the Lilliputians hung on Gulliver.

A flock of rigid leasing-practice standards has just been issued by Gordon Gray, Director of Defense Mobilization. They apply to any Federal agency that sees fit to rent production equipment to defense contractors.

Rent Is Stressed—From now on, there will be uniform contract provisions to cover (1) the term of the lease, (2) purchase option, (3) renewal option, (4) equipment maintenance, (5) installation charges, (6) transportation and removal costs, (7) rebuilding and overhauling costs, (8) rental fees.

This last item, rental fees, was really the first target in Mr. Gray's drive to stop charges that big military contractors were playing hanky-panky with government lease privileges. In June of this year he set up a schedule of uniform rental rates based on the acquisition cost and age of any machine. (THE IRON AGE, June 27, p. 87).

Loopholes Plugged—Now, the new directive is supposed to make government leasing absolutely foolproof in two important ways.

First is that machines will be rented to the military's prime or subcontractors strictly according to their need and the urgency of the work they're doing. A company's size or influence will not gain it any special consideration.

Second is that any lessee won't find it cheaper to rent government equipment than to buy his own or rent it from a private source.

Some Disagree — There's been considerable doubt about this last point. Many a would-be—but unsuccessful — lessee has squawked that the government's rental fees are 'way too low.

One last item in Mr. Gray's uniform leasing program can't be nailed down by executive fiat. It's the wish that machine tool rent money collected by any Federal agency must go into a fund to be used for equipment modernization and replacement. Legislation to accomplish this is in the works.

Final Check on Monster Drive

THEIR BIGGEST YET: That's this 5000-lb roller gear drive unit made by Ferguson Machine Corp., St. Louis. It's designed to index a torque load of 124,700 in-lb at 24 rpm, making 24 stops on each revolution.

INDUSTRIAL BRIEFS

To Measure Light — The Systems Div. of Consolidated Electrodynamics Corp. has contracts totaling $698,000. It is for specialized mass spectrometers to be used in the nation's atomic energy program. First contract for $584,700 was let by Union Carbide Corp., and the second for $113,300 by National Lead Co. of Ohio.

Stage Show—The atomic industry will stage its major 1958 trade show next March 17-21 at the International Amphitheatre in Chicago. The show will feature current developments in the industrialization of the atom. The event will be held in conjunction with the 1958 Nuclear Congress.

Service for St. Louis—In order to expedite shipment of its tubular mill products to customers in the St. Louis area, Revere Copper & Brass Inc. will open a redistribution center here. The center will house both Revere copper water tube and Revere Dryseal copper tube.

GETS TOP JOB: N. A. Olsen has been appointed director of the Metalworking Equipment Div. of the Business and Defense Services Administration. A government career man, he replaces temporary industry advisors as director of this division.

Philippine Progress — National Shipyards and Steel Corp. (NASSCO) Manila, will make capital additions to its facilities costing $12.5 million. It will be a major step toward making the Philippines self-sufficient in steel and steel products by 1960. Additions include a structural mill and a mechanized hot and cold sheet mill. They are to be erected at Iligan City, Mindanao, P. I., by Feb. 1959. The new installation is to be constructed by Loewy-Hydropress Div. of Baldwin-Lima-Hamilton Corp.

In a Nutshell—The Nutt-Shel Co., Glendale, Calif., has been acquired by Standard Pressed Steel Co., Jenkintown, Pa. SPS are manufacturers of precision industrial and aircraft fasteners and steel shop equipment. Acquisition was made through the exchange of 28,574 shares of SPS stock for all the capital stock of Nutt-Shel, producers of special lightweight locknuts used in missiles, electronic apparatus, aircraft, fuel tanks and related products.

Desert Industry—U. S. Borax & Chemical Corp. is now completing a new open pit mine and refinery in the Mojave Desert area of Southern California. It is expected to boost total American output by 30 pct. Designed to be a fully mechanical operation from pit to finished product, the project represents an investment of $20 million and more than two years work. Production is scheduled for Nov. 14, 1957.

Atoms, Custom-Made—A nuclear reactor is being designed for the custom production of radioisotopes, as well as training and research. It will be built by General Atomic Div. of General Dynamics Corp. at its John Jay Hopkins Laboratory for Pure and Applied Science at San Diego, Calif. Called the TRIGA, the reactor will have facilities for practical training in reactor operation and research in chemistry, physics, metallurgy, biology and medicine.

No Argument Here — D. A. Quarles, deputy secretary of defense, has been selected as the 1957 recipient of the American Institute of Consulting Engineers Award of Merit. The award will be presented by E. H. Anson, president of the Institute, on Oct. 15, at the Hotel Waldorf-Astoria. The award cites Mr. Quarles as an "able administrator and noted scientist."

Production Bars Raised — Bliss & Laughlin, Inc., Chicago, has completed the expansion of its Detroit plant. This enables Bliss & Laughlin to keep pace with the growing market for cold-finished steel bars. The Detroit plant is the newest of the company's four, and totaled 40,000 sq ft when originally completed in April 1953.

Cash, Notes and Stock — The Parker Appliance Co., Cleveland, consummated its purchase of the Hannifin Corp. of Des Plaines, Ill., for about $7.5 million, of which $5.5 million was paid in cash, $1.5 million in notes, and the balance in Parker stock. Parker Appliance shareholders have approved changing the name of the company to the Parker-Hannifin Corp.

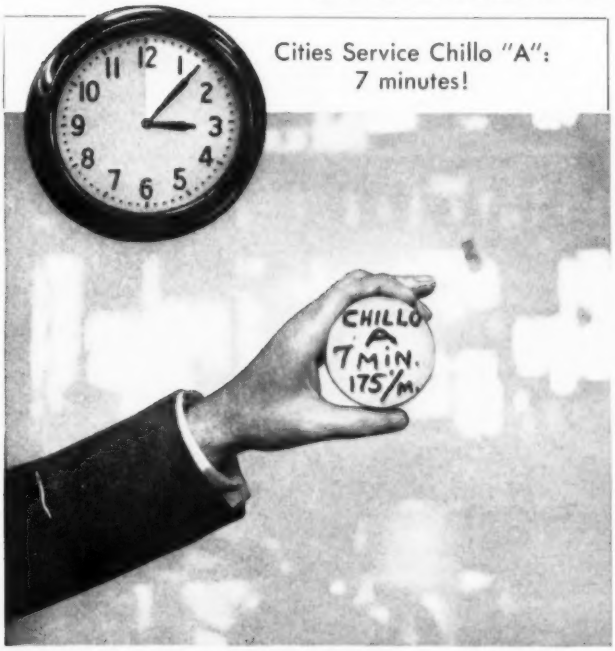
Matter of Timing—Construction has begun on a million-dollar engineering and research building program for Champion Spark Plug Co. Two new structures will be erected adjacent to the company's present Toledo, O. plant. Facilities will be for developing and testing spark plugs and will be available in July of 1958.

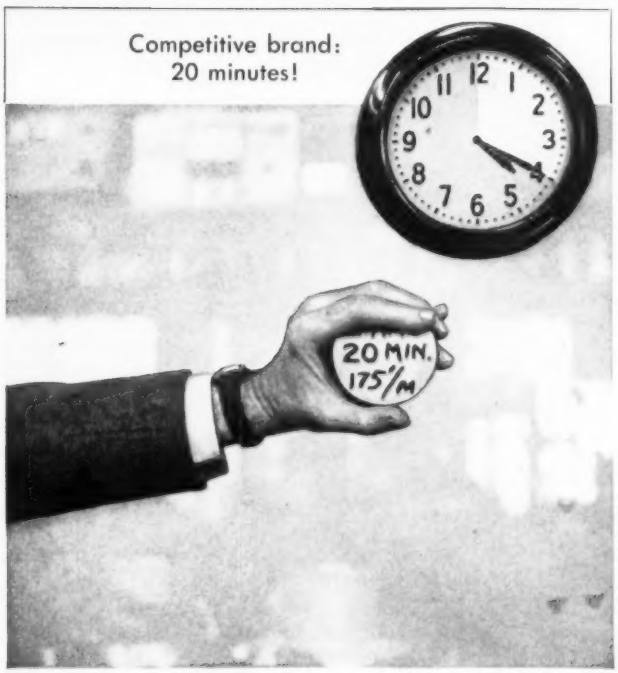
52100—Peterson Steels recently welcomed guests at an open house in its new Melrose Park (Chicago) warehouse. Unusual angle is that the new unit was built to handle 52100 bar and tubing exclusively.

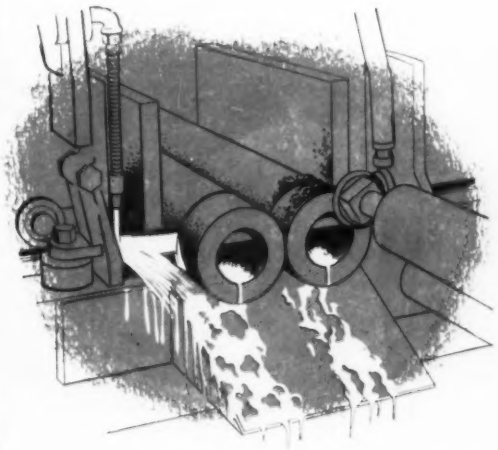
Change at Philly—Robertshaw-Fulton Controls Co., manufacturer of automatic control devices for home and industry, has changed the name of its Fielden Instrument Div. to the Instrument Div. The division is located in Philadelphia.

Cutting Oil takes the time test

at S. G. Frantz Co., Inc., Trenton, N. J.







S. G. Frantz Company decided to keep a truly open mind.

They'd been using Cities Service Chillo Cutting Oil and other Cities Service products for some time with great satisfaction. Still, there was no harm testing Chillo Cutting Oil against another brand just to make sure they were getting maximum results.

But even the people at S. G. Frantz never expected what followed. Using the competitive oil, and a piece of 4130 aircraft rod, 2⅞" in diameter, they made a single cut at saw speed of 175 feet per minute. Time: 20 minutes.

Next, the same test again – but this time with Cities Service Chillo "A" Cutting Oil. Time: 7 minutes! Nearly three times faster!

Using the same material on another job, the Frantz Company found difficulty making clean threads to aircraft standards on a Number 5 Turret Lathe—that is, until Cities Service Chillo 10Z was tried. Right there the problem ended.

"The problem ended." You'll hear it again and again from those who use Cities Service Cutting Oils and lubricants. And perhaps these oils can end a problem for you, too. Talk with a Cities Service Representative. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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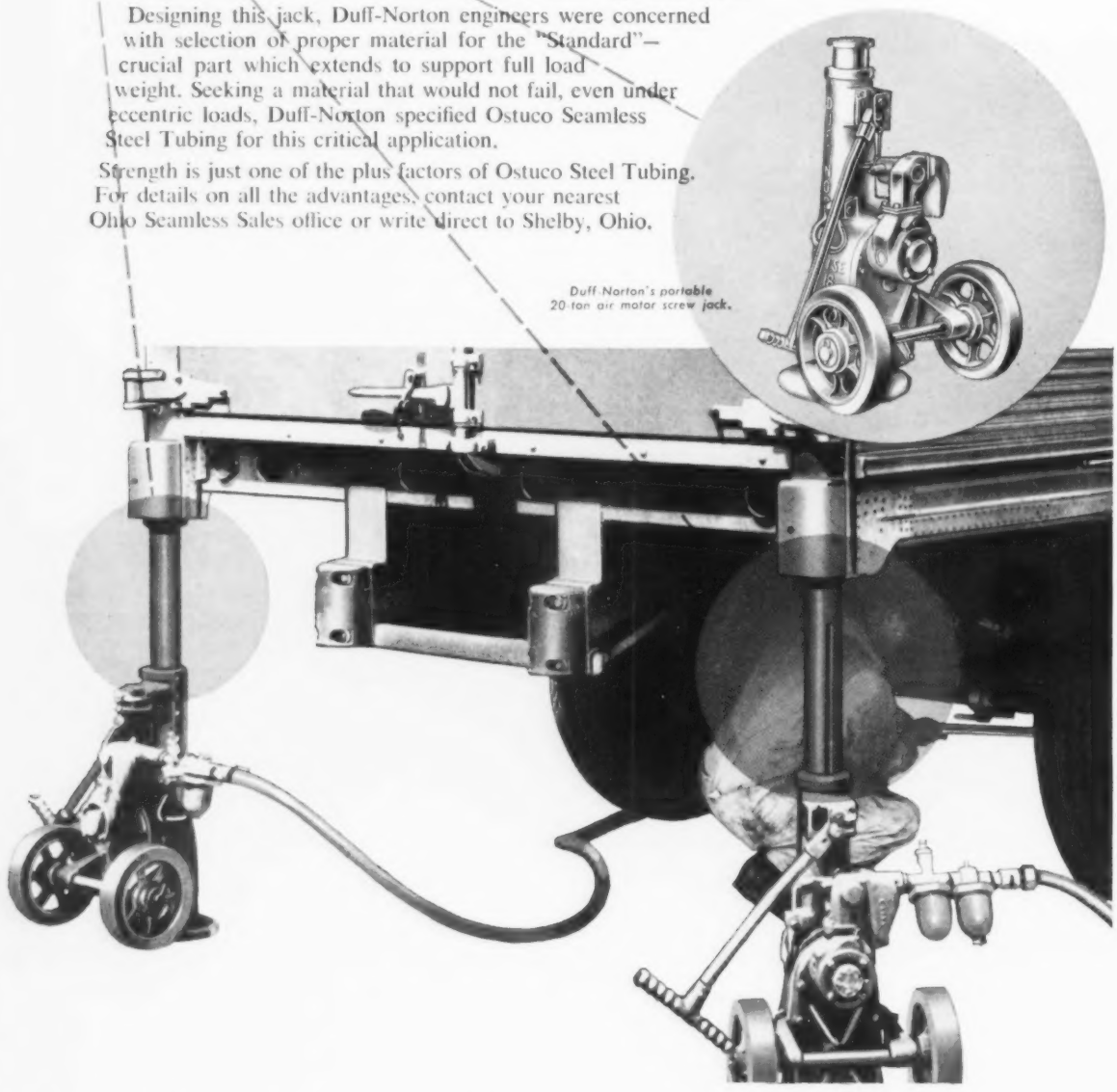
Designing this jack, Duff-Norton engineers were concerned with selection of proper material for the "Standard"—crucial part which extends to support full load weight. Seeking a material that would not fail, even under eccentric loads, Duff-Norton specified Ostuco Seamless Steel Tubing for this critical application.

Strength is just one of the plus factors of Ostuco Steel Tubing. For details on all the advantages, contact your nearest Ohio Seamless Sales office or write direct to Shelby, Ohio.



Duff-Norton's portable 20-ton air motor screw jack.

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CANADA: Railway & Power Engr. Corp., Ltd.
EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY, 225 Broadway, New York 7, New York

Felix Kremp, appointed vice president, Braeburn Alloy Steel Corp., Braeburn, Pa.

H. E. Connors, elected president, Connors Steel Warehouses, Inc., Pittsburgh.

G. S. Mikhalapov, appointed executive vice president, The Brush Beryllium Co., Cleveland.

E. A. Correa, elected vice president, Armco Steel Corp., Middletown, O.

J. A. Pollak, elected chairman of the board, The Pollak Steel Co.; **A. C. Weihl,** elected president; **David Pollak,** elected executive vice president.

F. T. Peterson, appointed president, The Black-Clawson Co., New York; **C. R. Crawford,** elected vice chairman of the board.

P. V. Hyland, appointed Southwest sales representative, Moffett Engineering Inc., Albany, Calif.

L. G. Maechtlen, named first vice president, Square D. Co., Detroit.

L. E. Grafft, appointed senior contracting manager, Pittsburgh district office, American Bridge Div., U. S. Steel Corp.; **J. C. Hamilton,** named asst. to vice president at the Division's Los Angeles office.

W. H. McComb, appointed plant manager, Ambridge plant, American Bridge Div., U. S. Steel Corp.; **J. A. Dunn,** appointed general plant superintendent.

R. W. Summey, named vice president, manufacturing, all plants, Bridgeport Brass Co., Bridgeport, Conn.

P. J. Roddy, appointed asst. general sales manager, American Screw Co., Willimantic, Conn.

J. D. Kleis, appointed vice president and director of research, Fansteel Metallurgical Corp., N. Chicago.

L. P. Vollmuth, appointed vice president, sales, and **C. H. Hellriegel, Jr.,** works manager, manufacturing, Bart Mfg. Co., Belleville and Newark, N. J.

P. J. Larson, appointed asst. to vice president, contracting, American Bridge Div., U. S. Steel Corp., Chicago; **D. J. Morfee,** named senior contracting manager, Division's Chicago office.

R. E. Krengel, appointed general manager, Ex-Cell-O Corp. of Canada, Ltd., London, Ontario.

H. M. Webber, appointed manager, process engineering, Harper Electric Furnace Corp., Buffalo, N. Y.

Denton Hassell, appointed manager, distributor sales, The Carmet Div., Allegheny Ludlum Steel Corp.

J. K. Heap, named asst. to the manager, Ingersoll Kalamazoo Div., Borg-Warner Corp.

H. O. Westendarp, appointed manager, arc welding sales, Eastern region, Air Reduction Sales Co.

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ENGINEERING REPRESENTATIVES IN MANY CITIES

The Babcock & Wilcox Co.'s Tubular Products Div., Beaver Falls, Pa. **J. F. Beck,** named metallurgist supervisor of technical service; **C. P. Church,** becomes metallurgist supervisor of process development; **Dr. J. F. Ewing,** appointed metallurgist supervisor of research; **T. M. Krebs,** named metallurgist supervisor of customer service.

L. R. Berner, appointed manager, operations Niles plant, National-Standard Co., Niles, Mich.

J. J. McDermott, named production manager, The Babcock & Wilcox Co.'s Barberton, O., Works.

M. I. Cleveland, appointed manager, product service, Large Steam Turbine-Generator Dept., General Electric Co., Schenectady, N. Y.; **T. W. Howard,** named consultant, product service.

J. M. Darbaker, president, elected chief executive officer, Copperweld Steel Co., Pittsburgh. He will continue as president and serve as acting chairman.

R. A. Ramsay, appointed sales manager, Mechanics Universal Joint Div. of Borg-Warner Corp.

H. H. Price, appointed manager, Wire Rope and Construction Material Products Dept., Chicago district sales office, American Steel & Wire Div., U. S. Steel Corp.

W. L. Richardson, appointed asst. to the manager, sales, "Cargotainer" Div., Tri-State Engineering Co., Washington, Pa.

W. C. Wright, appointed production manager, SKF Industries, Inc., Philadelphia.

H. F. Kelley, appointed superintendent and **E. R. Mackey,** to asst. superintendent, coke plant, Republic Steel Corp.'s South Chicago operations; **P. A. Noyes,** appointed sales representative, Berger Div., Philadelphia sales office; **R. A. Rothacker,** appointed superintendent and **G. E. Harlan,** named general foreman, Union Drawn Steel Div. plant, Beaver Falls, Pa.

R. L. Countryman, appointed sales manager, Outboard Motor Div., The Oliver Corp.

R. E. Savage, has been placed in charge of the Distributor Sales Section, Nickel Dept., The International Nickel Co., Inc.

F. G. Hensel, appointed administrative manager, Robins Engineers Div., Hewitt-Robins, Inc., Stamford, Conn.; **J. Van Kleunen,** pro-

moted to manager, engineering sales; **D. H. Martini,** promoted to manager, engineering sales service; **E. H. Fallon,** promoted to contract manager, and **R. W. Taylor,** promoted to chief estimating engineer, Rock Products Dept.

J. R. Davis, appointed Southeastern representative, Machine Div., Osborn Mfg. Co., Cleveland.

R. F. Lab, appointed asst. general superintendent, Warren, O., plant, Copperweld Steel Co.

W. M. Kerrigan, appointed manager, Flexloc sales, Locknut Dept., Standard Pressed Steel Co., Jenkintown, Pa.; **F. R. Lindh,** becomes asst. manager, Flexloc sales.

E. J. Bolduc, named New England district sales manager, and C. P. Harlow, named sales manager Hardware Products Dept., Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp.

Joseph Shelton, appointed general manager, sales, Los Angeles Div., Ducommun Metals & Supply Co.

T. J. Small, appointed Southwest district manager, Morrison Products, Inc., Cleveland.

OBITUARIES

F. R. S. Kaplan, 71, chairman of the board and chief executive officer, Copperweld Steel Co.

G. S. Crane, 69, chairman of the board, Cutler-Hammer, Inc., Milwaukee.

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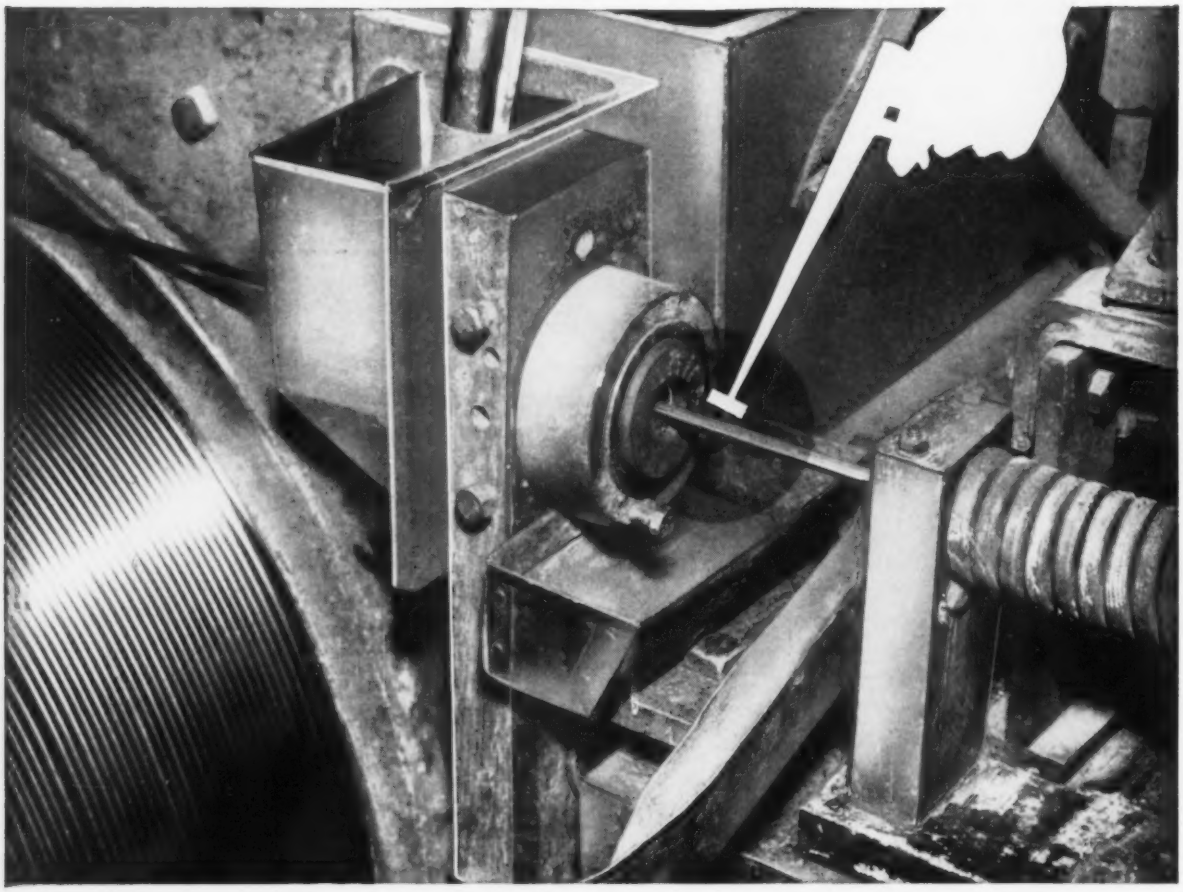

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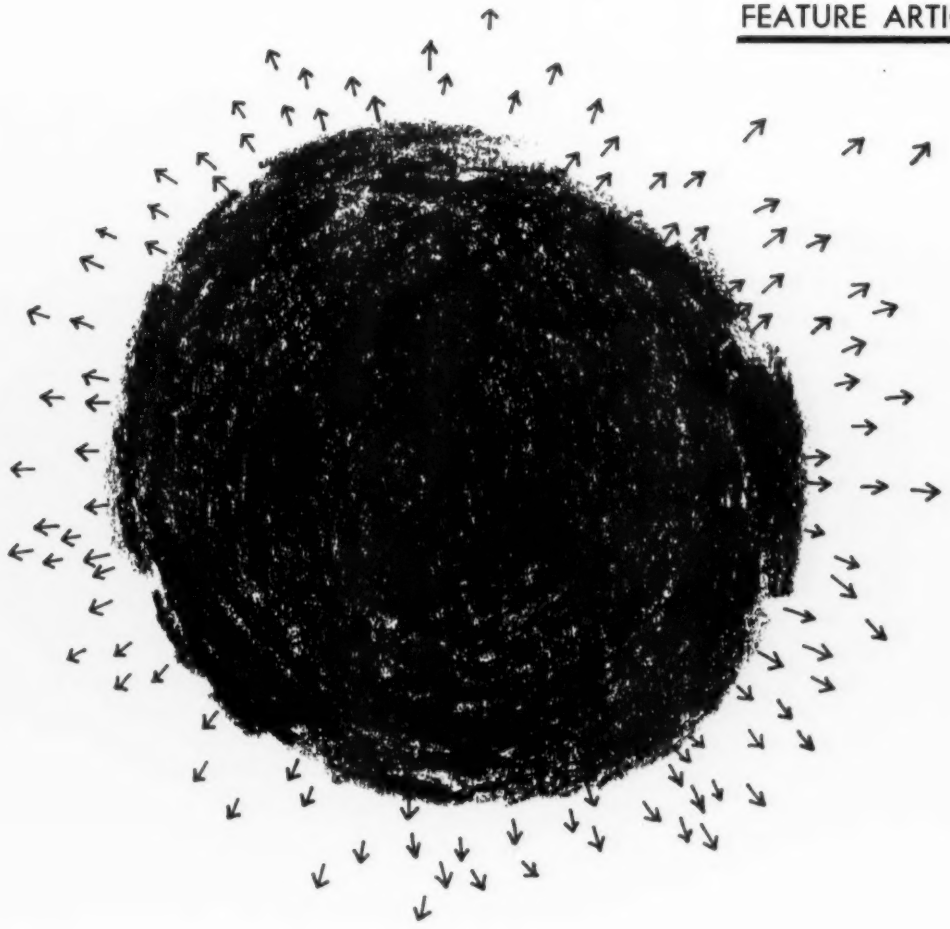

Radioisotopes: Use Them on Tough Problems

By C. M. Crompton—Associate Technical Director, National Lead Co. of Ohio, Cincinnati

Radioactive materials may be considered "hot" in one sense. But each year they save cool millions for progressive firms in the metal industry.

Many knotty problems, in research labs and on production lines, have already yielded to modern nuclear techniques.

Here's a rundown of what's going on, and a bit of what you might expect in the future.

▪ After a little more than 10 years of peacetime distribution of radioactive isotopes, the metals industry has become one of the largest users of isotope gages and tracer techniques. Through versatile application of these "peacetime atoms," it has probably saved hundreds of millions of dollars. Unquestionably, it is producing many products better and more easily.

The breadth of these applications is impressive. It ranges from basic metallurgical research (such as metallography, and studies of mineral flotation and slag-metal reactions) to practical production areas, such as the continuous noncontact gaging of rolled sheet and strip.

Most of the production applications involve measuring that amount of radiation which either (1) succeeds in penetrating a given material or (2) is scattered in a backward direction.

A Classical Use—The penetra-

tion principle has long been used in nondestructive X-ray inspection of metal castings and welds for flaws. Now, however, more than 500 radiographers advantageously use reactor produced radioisotopes for examining both light and heavy metals.

The same principle is used to measure thickness of metal strip in continuous production, Fig. 1. Radioisotope gages successfully check steel products ranging from 0.0001 in. to 2 in. in thickness. And precise, non-contact thickness gages of this type have also been a boon to production control of brass sheet and strip.

The greatest benefit in these gages stems from their use to actuate automatic control equipment which makes corrective adjustments in the process.

Near-Perfect Control—In a tandem cold rolling mill, for example, control accuracy (to two sigma limits) was only ±7 pct when a radiation gage was combined with manual roll adjustment. The variation was reduced to ±1.5 pct by using the gage in conjunction with automatic control.

Beta gages also solve the problem of measuring ultra thin "electrical steel" strip, rolled to thicknesses between 0.0001 and 0.0005 in. Such gages automatically compensate every half hour for changes in temperature, humidity, dust accumulations on the radiation window, and other external conditions.

Reflected or backscattered radiation is also used to measure the thickness of material coatings, or of the materials themselves. Here, both the radioactive source and the detector are on the same side of the material, Fig. 2.

A Big Field—This use depends on the coating being of a different material (atomic number) than the underlying base. Typical applications include the measurement of electroplated, plastic, porcelain, paint and lacquer coatings on metal products.

One example of backscatter gaging is the continuous measurement

▪ The 1957 Trade Fair of the Atomic Industry will be held at the New York Coliseum from October 28 through 31. At the same time, the Atomic Industrial Forum will hold its Fourth Annual Conference, and the American Nuclear Society, its Second Winter Meeting. For complete details, contact Atomic Industrial Forum, 3 East 54th Street, New York 22, N. Y.

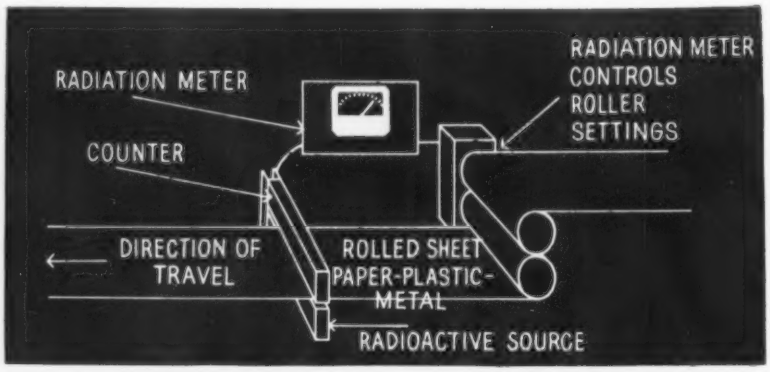

FIG. 1: Radioisotope gages are widely used for measuring and controlling strip thickness on continuous lines. The method is rapid and reliable, does away with marking and tearing of the material.

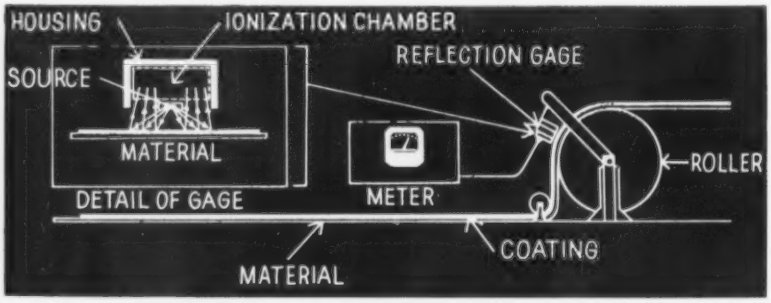

FIG. 2: Reflected radiation measures thickness of coatings and/or materials on which they're deposited. It can be used where only one side is accessible—source and detector are located on the same side.

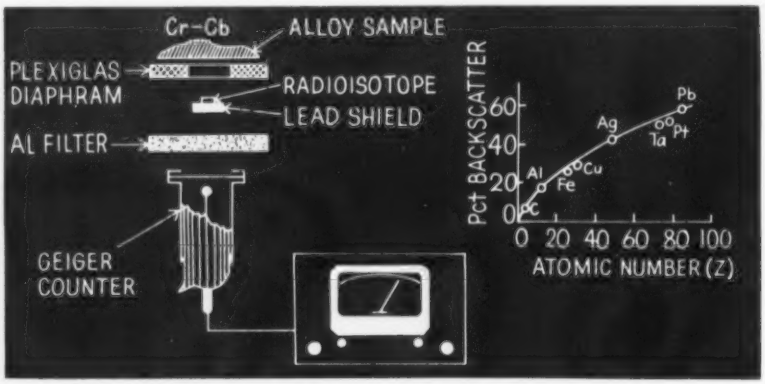

FIG. 3: Reflection principle is also being applied to alloy analysis. Linear relationship between alloy content and intensity of reflected beta radiation makes fast and accurate determinations possible.

of a zinc coating applied to steel strip in a continuous process. Two "heads" containing radioactive sources and detectors are located in the production line to monitor both surfaces of the strip.

The gage measurements compare very well with coating weights determined by chemical analysis. Approximately 95 pct of the gage values agree within 0.06 oz of the chemical weight determinations. Moreover, the radiation device spots coating irregularities immediately and corrects them instantly with the required machine adjustment.

Important Savings—The benefits produced by both penetration and backscatter type gages include: (1) material saved by nondestructive test methods, (2) reduction in machine or process downtime, (3) more efficient use of raw material, (4) fewer inspectors needed, (5) faster processing, (6) fewer product rejects.

The radiation reflection principle has also been used to measure the chromium content of a chromium-niobium alloy, and similarly, the iron in an iron-tungsten alloy, Fig. 3. There is a linear relationship between alloy content and the intensity of reflected radiation. With alloys containing more than 3 pct niobium, analysis was accurate to ±2 pct.

Aside from sheet and strip gages, Fig. 4 shows how the thickness of deposits inside internal combustion engines can be measured. Radioactive metal plated on the surface of the plug inserted in the engine wall has a certain original intensity. The film or deposit accumulated on the plug reduces this to an extent which can be accurately measured when the plug is removed.

Works To "Trillionths"—Fig. 5 shows schematically how the thickness of a vacuum cast film can be measured to the trillionth of an inch by a shadow-casting technique. Radioactive chromium is used. The amount of radioactivity subsequently measured on the surface of

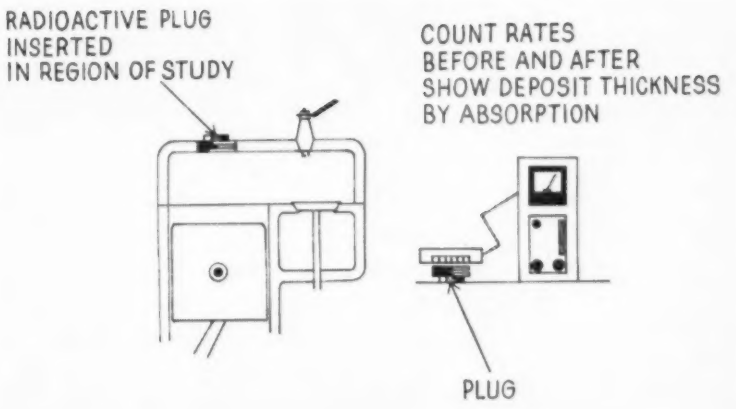

FIG. 4: Extent to which film or deposit inside internal combustion engine reduces intensity of radiation determines film thickness. It's measurable after a few minutes of operation, so shutdowns are brief.

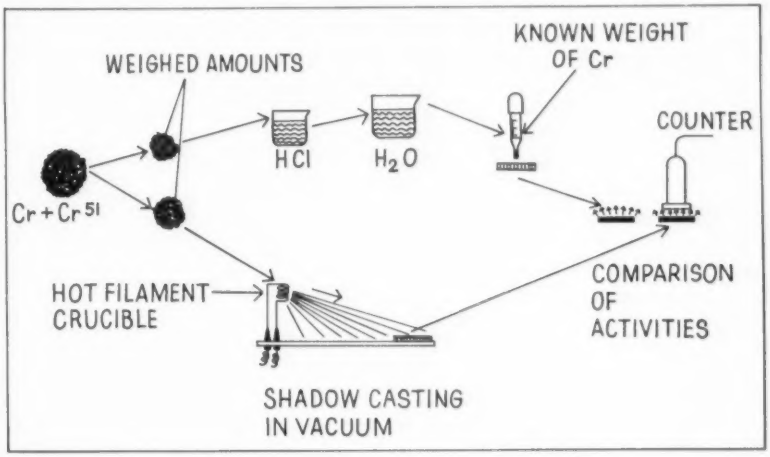

FIG. 5: Setup for measuring deposit thickness in a vacuum-cast film. Shadow-casting technique calibrates distribution from the crucible, actually measures thickness of the film to a trillionth of an inch.

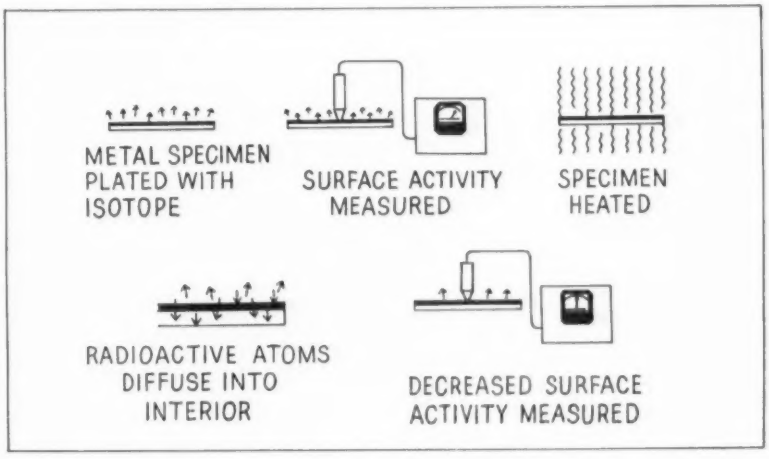

FIG. 6: Radioactive isotopes are quicker and more reliable than other methods of measuring rate and amount of diffusion in solids. They provide the only method specific enough to measure self-diffusion.

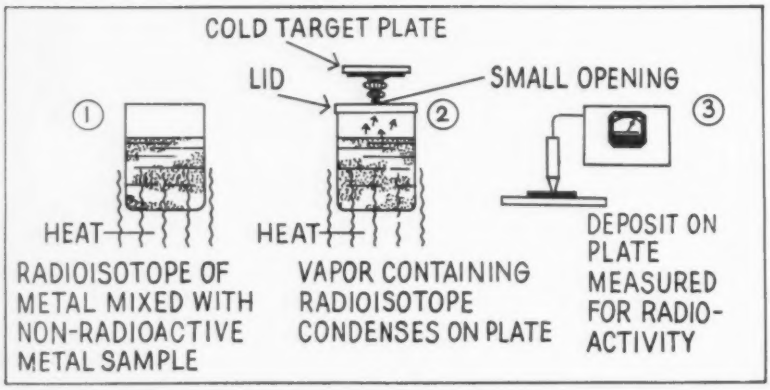

FIG. 7: Another example of how metallurgical research has benefited from use of radioisotopes is this means for measuring vapor pressure of metals. It's more accurate than chemical or physical methods.

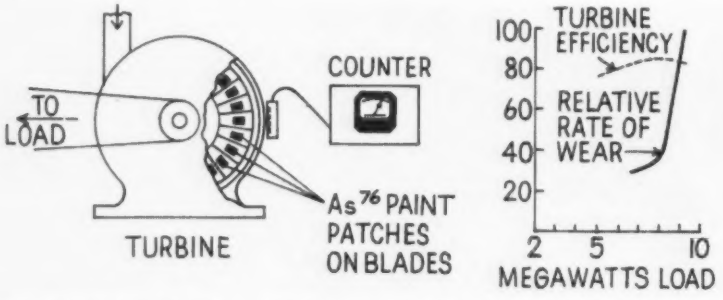

FIG. 8: Patches of radioactive paint on turbine blades make it possible to compare wear at various loads while equipment is operating. Curve shows high erosion begins just beyond peak turbine efficiency.

the coated piece indicates the film thickness precisely.

Aside from the typical production applications already described, one of the most promising areas for applying radioisotopes is that of metallurgical research.

Because radioactive atoms give off penetrating, easily identifiable signals as they move or react in any system, researchers have (at long last) a powerful technique for studying the physical and chemical behavior of materials and processes.

Measures Diffusion—With radioactive tracers, for example, it was possible for the first time to obtain accurate information on solid diffusion. Fig. 6 shows how this is done.

In other cases, radioactive isotopes of high melting point metals are used to measure vapor pressures rapidly and accurately, Fig. 7. Close measurements can be made after very minute amounts of material are vaporized.

Studies have also been made with radioactive calcium to measure its transfer and distribution across slag-metal interfaces. In one study, sensitivity of the technique revealed that the calcium content of the steel was less than 0.00006 pct.

Quick Wear Check—Radioisotopes can also measure wear of materials under a variety of conditions with accuracy and precision. The use of radioactive cutting tools to measure tool wear is fairly well known.

In a similar fashion, wear of electrical contacts can be studied by making one contact radioactive. A five-minute tracer test on distributor points gives an answer that formerly took 200 hours of running time. Such tracer studies can often be done for as little as 5 pct of the cost of conventional wear-test programs.

For Electroplaters—Tracers are also proving important in the study of electroplating phenomena. By plating irregularly shaped objects with radioactive copper for just one minute, it was possible to determine the quantitative effect of shape, edge and corner effects on plating thickness.

Wear on wire drawing dies can also be measured by irradiating a test die in a nuclear reactor. The amount of wear is revealed when the wire drawn through the die is coiled around a Geiger tube and measured quantitatively for radioactivity.

The rate of cavitation erosion in a large turbine has also been measured effectively, Fig. 8. Since it was difficult to irradiate entire blades, the use of paint containing a radioactive tracer was a simple expedient for showing relative rates of erosion at different speeds.

Dictates Top Speed—These tests clearly showed that excess wear occurred immediately beyond the point of peak turbine efficiency. Thus, there was an obvious need for strict operating specifications.

Almost any chemical compound can be specially prepared to contain a radioactive tracer for research purposes. In mineral flotation, for example, flotation agents can be "tagged" with a tracer. The amount of the agent that will adhere to the surface of specific minerals can then be checked to within 0.0000001 mg.

The metals industry must be alert to progress anywhere in the use of nuclear techniques. Developments in another field of industry or science are often directly applicable to the metals industry's own problems.

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New Spiral Point Boosts Twist Drill Efficiency

The latest news in metal drilling is a new spiral pointed twist drill.

It uses a true, self-centering point and an S-shaped cutting edge in place of the conventional chisel point.

Production tests support its claims for faster, more accurate hole drilling.

▪ Eight major metal drilling advantages are claimed for a new type of twist drill which is ground to a three-dimensional spiral point instead of the century-old chisel edge.

Drills ground to the new design are said to (1) last longer; (2) produce rounder, straighter, on-size holes; (3) require no center punching; (4) work with less thrust force; (5) reduce workpiece distortion; (6) maintain hole-positioning accuracy; (7) save reaming in many cases; (8) yield burr-free holes in sheet metal.

Geometry of the new spiral point was developed by Cincinnati Milling Machine Co. researchers. They challenged the efficiency of the conventional chisel pointed twist drill because of its lack of centering ability and inherent poor cutting action under the chisel edge.

No Point, Really—Their contention is that the normal chisel point is not really a point at all. Instead, it is virtually a straight edge parallel to the surface of the workpiece.

In practice, moreover, one end of the chisel edge is often ground slightly higher than the other. This causes the drill to "walk" unless it is either restrained by a bushing or guided on entry by a center punched hole.

Another drawback the research team sought to overcome was the large negative rake angle near the center of chisel point drills. At a radius of 0.030 in. from the center of a ½ in. drill, this negative angle is about 53°.

Chip Is Trapped—The combination of high negative rake and low speed at the point axis works to produce a low shear angle with a resultant high thrust force. The chip is virtually trapped at the bottom of the hole and cannot readily escape into the flute space. Thus, action at the chisel "point" is more like extruding than cutting.

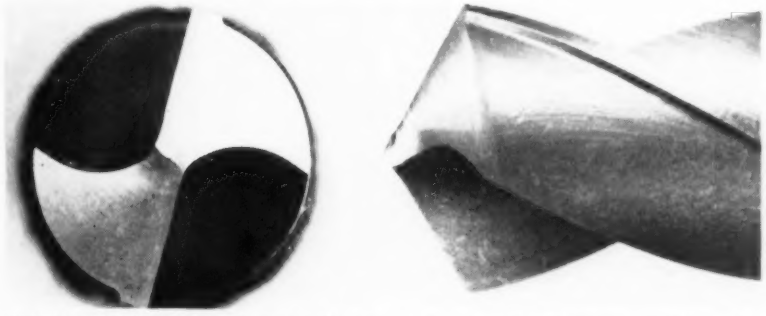
The new spiral point, with its S-shaped cutting edge, reduces this negative rake angle by half, at least. Drills pointed in this fashion both automatically center themselves and proceed with a free cutting action near the axis.

Company research also produced a grinder to generate the new spiral point quickly and economically on any double-fluted twist drill up to ¾ in. in diam. Manufacture and sale of these machines is handled by an affiliate firm, Cincinnati Lathe & Tool Co.

Vary Point Angle—The grinder can be adjusted to vary the drill point angle from 90° to about 180°. The latter angle, coupled with the spiral point geometry, is used to drill round, true-to-size holes in sheet metal with almost a trepanning action. There is virtually no burr on the underside of the sheet.

Several production case histories

CHISEL POINT: Traditional edge produces low shear angle with high thrust force. Action is more like extruding than cutting.



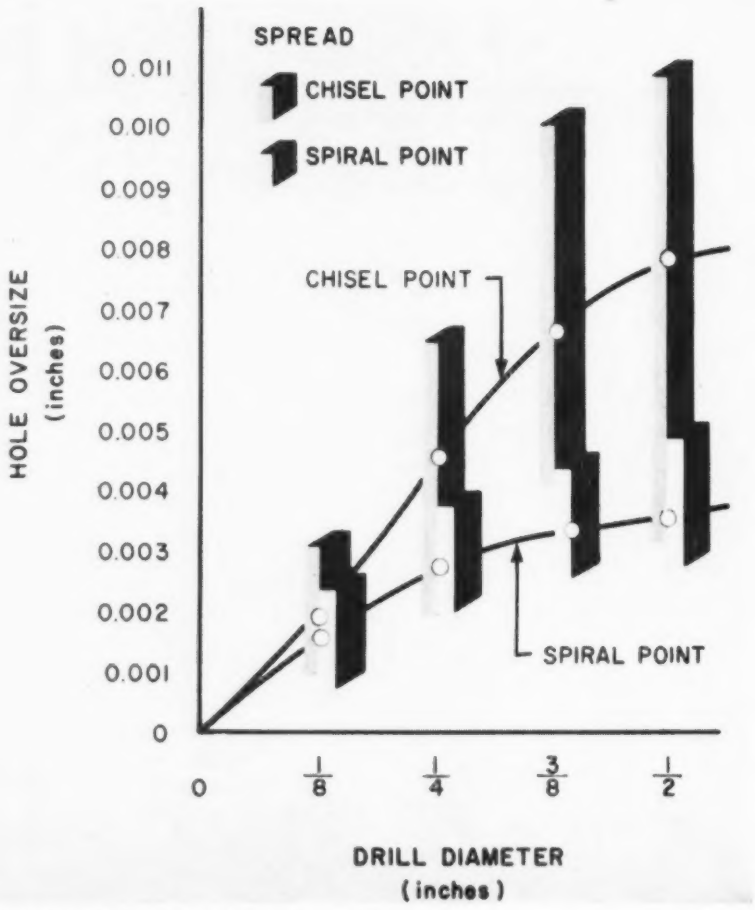
SPIRAL POINT: Drill automatically centers itself. S-shaped cutting edge gets free cutting action near the axis.

demonstrate the numerous advantages claimed for these spiral pointed drills. In one 12-month test, drilling 21/64-in. diam holes in SAE 8650 steel nuts, spiral point drill life between grinds averaged six times that previously obtained. Time saved in changing drills was 96 minutes per day.

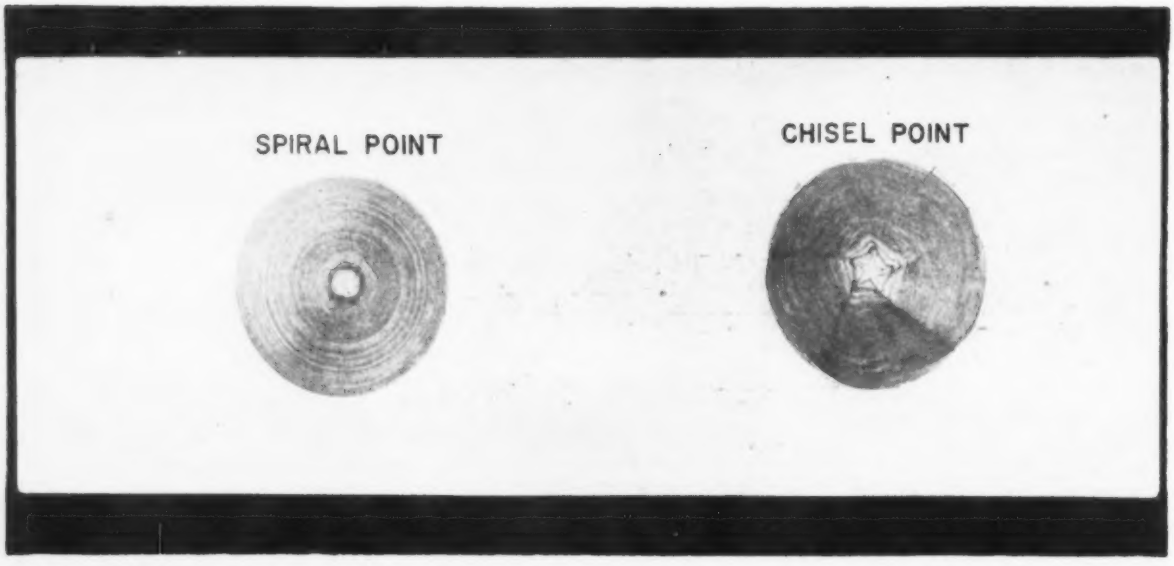
Another case involved drilling a ⅛-in. diam hole in an SAE 8650 piston pin and holding tolerance within ±0.001 in. of the centerline. In a lot of 5000 pins, all holes made with chisel point drills were out of tolerance. But less than 5 pct of the parts were beyond the size limits when spiral point drills were used.

Stay Within Limits—Similarly, in drilling 25/32-in. diam holes in cast iron cylinder blocks, spiral point drills eliminated the need for center spotting. They also maintained tolerances within ±0.003 in. at a feed rate of 2 ipm, whereas chisel point drills had difficulty in holding size within ±0.005 in. at a rate of only one inch per minute.

Cost of grinding the new spiral point geometry on any make or type of drill is said to be equivalent to that of grinding a conventional chisel point.



COMPARISON PROVES: The difference comes out in narrow spread of values, as well as uniformly lower values, for the spiral point.

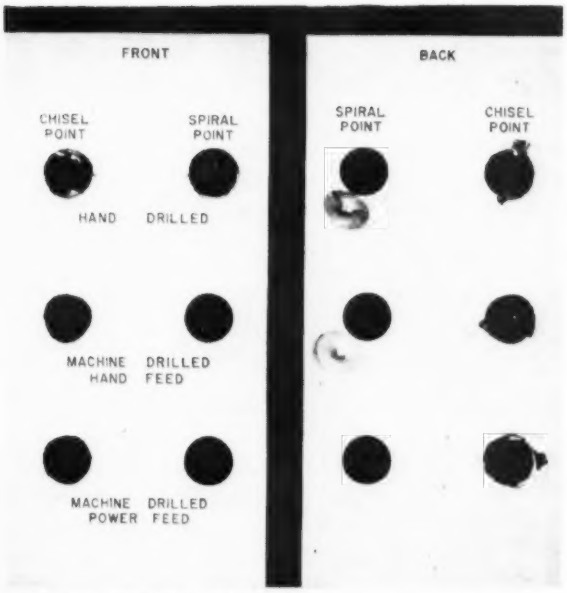


EASY STARTING: The spiral point with its self-centering action forms a round hole from the beginning. Compare this with the starred erratic form exhibited by conventional chisel point.

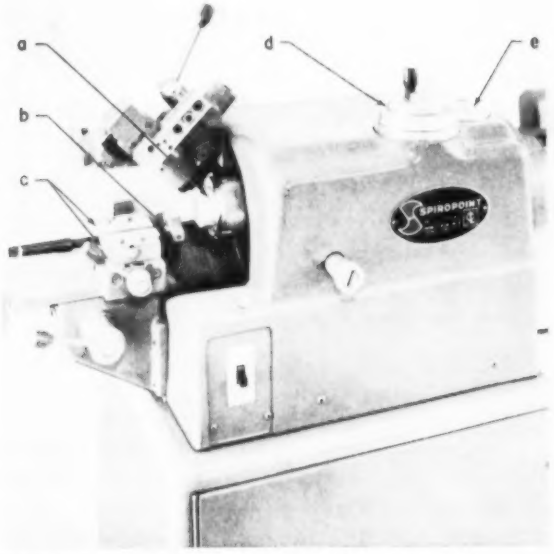
How Drilling Forces Compare

Material	Feed	Thrust – lb		Torque – in.-lb	
	in./rev	Spiral Point	Chisel Point	Spiral Point	Chisel Point
AISI – 1112 (132 Bhn)	0.004	195	290	40	40
	0.007	310	410	60	55
	0.010	410	510	80	80
AISI – 1018 (153 Bhn)	0.004	275	350	45	45
	0.007	400	485	70	80
	0.010	520	610	100	115
AISI – 4150 (200 Bhn)	0.004	260	350	40	45
	0.007	380	490	70	70
	0.010	500	610	95	105
AISI – 4340 (200 Bhn)	0.004	300	400	50	50
	0.007	460	575	85	85
	0.010	600	750	115	125

SHEET METAL TYPE: By changing the point angle from 118° to 180°, the spiral point bulges the surface material forward. The peripheral portions of the cutting edges then act as trepanning tools to eliminate the burr commonly formed with usual point angle.

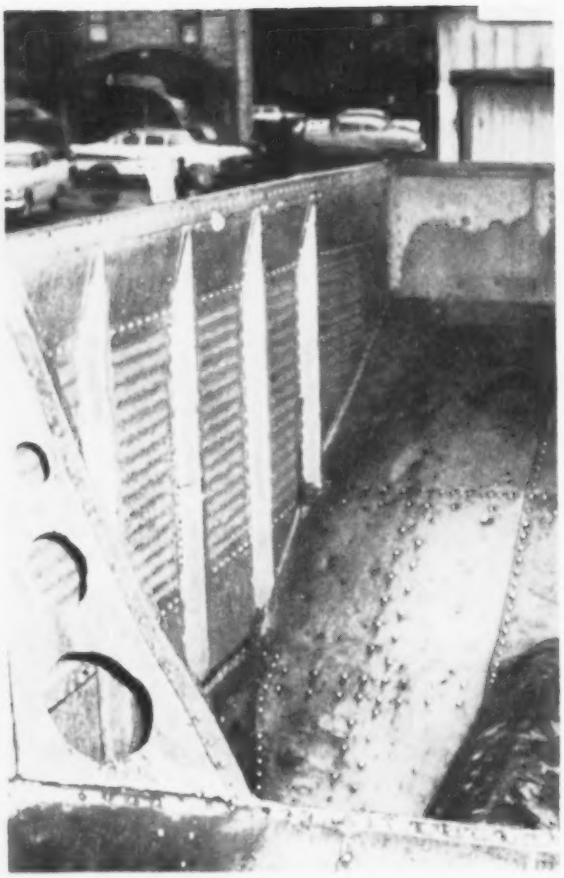


CLEAN HOLES WIN: Spiral point drill breaks through sheet metal without grabbing. Not so with the chisel point: Extruding action results in burring and grabbing of the drill.



GRINDS SPIRAL POINT: Grinding wheel (a) generates spiral shape on drill held in jaws (c) against control bushing (b). Dial (d) provides radial and axial motions; dial (e) adjustment for relief.

BUILT FOR SERVICE: These corrosion-free parts, including hopper doors, required no major repairs.



USE LIGHTER GAGE: Stainless sheets on this B & O hopper car need no allowance for corrosion wastage.

Stainless Hopper Cars Stand

By **J. Halbig**—Senior Research Engineer, and **R. K. Thompson**—Development Engineer, Armco Steel Corp., Middletown, O.

A corrosive-resistant material may cost more pound for pound, but its advantages may far outweigh the extra cost.

Stainless steel does the job without needing the traditional allowance for corrosive wastage.

The designer can pay more attention to strength requirements, knowing that the surface of the steel will serve through the years without maintenance.

▪ Two stainless steel hopper cars were recently inspected after more than 20 years of continuous coal hauling service. Both show negligible corrosion damage and should be good for many more years of active service.

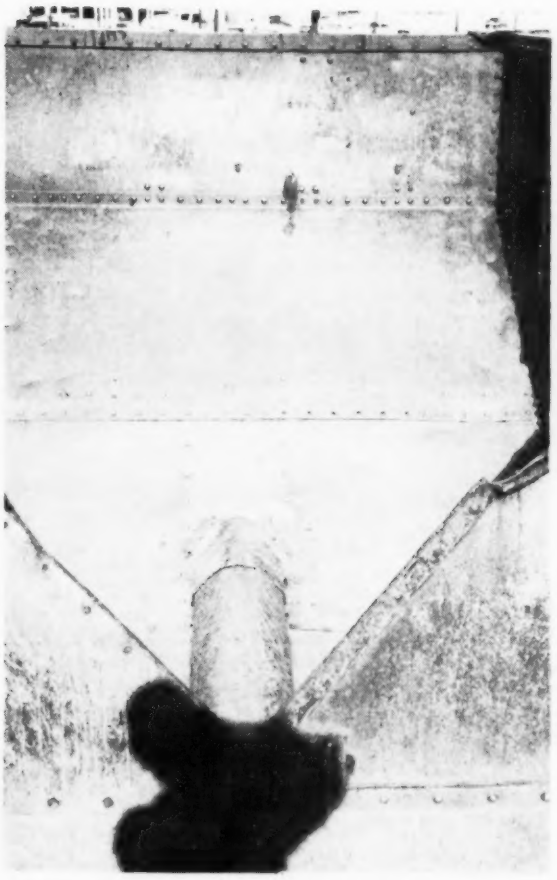
Each car has interior members made of Type 410 stainless steel. Both riveting and welding were used for joining.

One car rolled out of Baltimore and Ohio's Mt. Clare shops in March 1935. The other left New York Central's Beach Grove shops in August 1936.

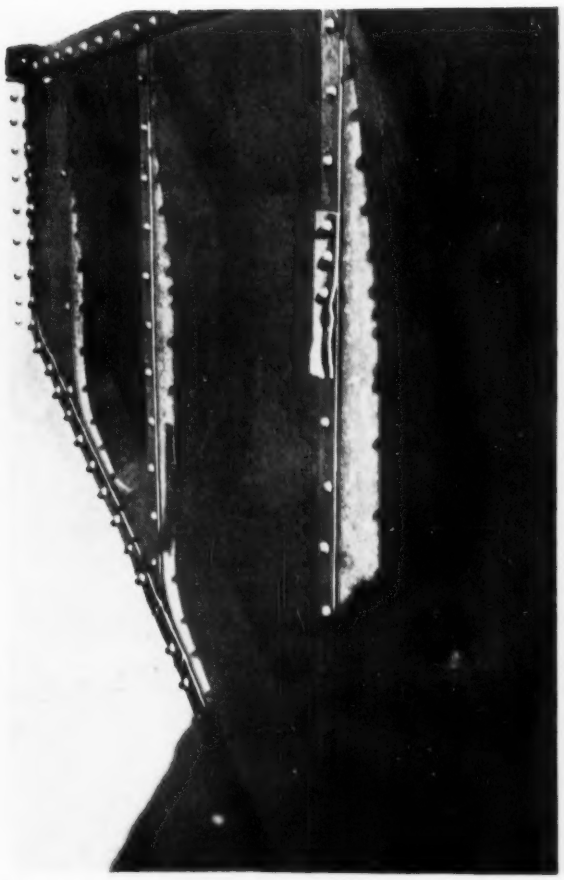
The 3/32-in. thick sides of the B & O car are corrugated while the NYC car has ⅛-in. thick pan-type side panels.

Corrosion Free—The floor sheets in the B & O car remain free of corrosion and generally in excellent condition. Dents that can be observed were undoubtedly caused by heavy loading equipment, but are not severe.

Several small tears in the floor were repaired by welding before a 1948 inspection. There is no



CONTINUOUS DUTY: This NYC hopper car suffered corrosion early, but the pitting has never spread.



SURFACE EFFECT: Light pitting on pan-type side panels of NYC car has not affected strength of sheet.

Long Service

evidence of corrosion or cracking in the vicinity of these welds.

One end sheet on the "B" end (the end with hand brake) had been replaced before 1948 due to damage by "cornering." Similar mechanical damage was repaired at the "A" end.

No Major Repairs—The condition of the cross ridge sheet, the longitudinal hood sheet, and the hopper doors in the "A" portion of the B & O car shows absence of corrosion. The floor and side hopper sheets are in excellent condition, although there is evidence of hammering to dislodge frozen coal in the outer hopper sheets. No major repairs have been required in these locations.

While occasional cracks are present at stressed locations in the side stakes, the sides remain straight and trouble-free.

While both hopper cars proved themselves in service, it's the B & O car that is of significance because of its light gage construction.

Limited Pitting—In 1948 inspectors found a pitted condition over much of the interior of the NYC car. As two similar cars (since wrecked) did not show this condition, it is surmised that the car had at some time in its early life transported a particularly corrosive lading.

In any event, the most recent inspection indicates that these pits have not progressed.

The performance of these stainless hopper cars bears out the contention that Type 410 stainless steel will withstand years of service without usual costly repairs. It should be possible to employ material thicknesses for hopper car service more nearly on the basis of required strength than with heavy allowance for corrosion wastage.

From a maintenance standpoint, costs favor the tough surface that needs no protective coating.

Speed Alloy Analysis by X-ray

By V. W. Palen—Sales Engineer, North American Philips Co., Inc., Mt. Vernon, N. Y.

Aside from other advantages, metal analysis with the X-ray spectrograph is inexpensive and fast. It's the chief reason why this method is growing so rapidly.

Here's an example of the kind of job it can do in checking alloy analysis.

■ Faster and more accurate control of alloy production is now obtained by X-rays at a quarter the cost of chemical methods. The non-destructive technique is used on 29 different alloy grades at the Kokomo, Ind. plant of Haynes Stellite Co., a Division of Union Carbide Corp. It gives information on nine elements in quantities ranging from 1½ to 30 pct by weight.

Some 1100 analyses per month are made by X-ray. They check content of chromium, tungsten, iron, molybdenum, nickel, cobalt, titanium, manganese and vanadium. Difficult problems are solved in about 20 minutes. Formerly, they took up to 24 hours by wet chemistry.

The Kokomo plant produces metals for cutting tools, hard-facing welding rods and investment castings. The company also makes high temperature and corrosion-resistant alloys in both cast and wrought form and finished products such as valve seat inserts and other machine parts. Tungsten carbide inserts and crushed particles, and Stellite welding rods are made for wear-resistant applications.

Tough Tests First—The accompanying table shows alloys currently analyzed with the X-ray spectrograph. Tests first assigned to the X-ray instrument for analysis were the ones most difficult to handle by wet chemical methods. For instance, determination of tungsten in Haynes Alloy No. 25 by chemistry takes 24 hours. The most precise wet analysis requires even longer. By contrast, the X-ray procedure takes only 20 minutes. Not only that, once the X-ray routine is set up, additional specimens are checked for tungsten in 3 minutes with great accuracy. In comparing X-ray and chemical results, it's found that an average error for X-ray is 0.77 pct; with chemistry it was 1.69 pct.

Alloys made by the company are produced in electric furnaces. After charges are melted, they are poured into ingots, molds or shot towers. This latter procedure shapes the metal into globules under ½ in. diameter. These pellets are then remelted in a small induction-type furnace and the metal is poured into molds for investment casting.

Sample Preparation—X-ray specimens are taken from the master heat at the time of pouring. Usually, molds are 1⅛ in. diameter by 5 in. long. Pieces of proper thickness are sawed off to fit the X-ray holder. When an alloy is too hard to saw, it is poured into a mold the size of the holder.

Specimen preparation is a simple two-minute routine using two sanding machines. One has a 40-grit belt; the other a 120-grit belt. Each alloy disk gets a few strokes on the coarse belt and similar treatment on the fine belt. By this means the operator cleans the specimen and polishes its surface until the texture is uniform, a quality he judges by appearance. Contamination is avoided by reserving one pair of belts for each alloy.

Elements Determined by X-ray Spectrograph

(Normal content of major elements, pct)

Iron Base Alloys	Cr	W	Fe	Mo	Ni	Co	Other
Haynes Alloy No. 93	17		Bal.	16		6	2V
Multimet Alloy	21	2.5	Bal.	3	20	20	1Cb- Ta
Stainless Steels 300 Series (11 alloys)					8-22		
Nickel Base Alloys							
	Cr	W	Fe	Mo	Ni	Co	Other
Hastelloy Alloy B			5	28	Bal.		
Hastelloy Alloy C	15.5	4	5	16	Bal.		
Hastelloy Alloy F	22		20	6	Bal.		2Cb- Ta
Hastelloy Alloy X	22		18	9	Bal.		
THET Alloy	25	7	3	3	Bal.	12.5	2.5 Mn
GMR-235	15.5		9	5	Bal.		2 Ti 3Al
Cobalt Base Alloy							
	Cr	W	Fe	Mo	Ni	Co	Other
Haynes Alloy No. 31	25.5	7.5			10.5	Bal.	
Haynes Alloy No. 25	20	15	2		10	Bal.	
Haynes Stellite Alloys (8 alloys)		8-18					

Method

Before the present technique for specimen preparation was adopted, many additional refinements in the procedure were explored. This work included studies on effects of electrolytic etching, and polishing on 220, 320, 400 and 600-grit belts. Tests showed that consistent results could be secured without these more involved preparatory steps.

Checks vs. Standards—The company obtains accurate analysis data with the X-ray spectrograph through the use of alloy standards. These are compared with metal specimens, whose characteristics are unknown. At present, operating schedules employ 120 standards arranged in groups of 4 to make 30 sets.

Originally, the firm thought that 28 standards would be needed for stainless steels in which nickel varies from 8 to 22 pct. After a few trial runs, researchers found that 15 standards are sufficient. In analyzing one nickel-base alloy for five different elements only four standards are needed, where 20 were first thought necessary. Similarly, the number of standards was reduced on cobalt-base alloys where tungsten ranges from 8 to 18 pct.

X-ray spectrograph achievements at the Haynes Stellite plant are largely credited to A. M. Reith, Chemist, and E. D. Weisert, former head of the product development section. Company records show that the tungsten target X-ray tube has been in operation more than 6000 hours. Maintenance schedules call for checking operating characteristics on all electron tubes every three months.

Other Uses—Some unusual problems are handled by the X-ray group in addition to regular routines. One such job is measurements of surface depletion of elements in annealing and pickling processes. Specimens are checked as they come from the heat and again after processing. This procedure requires removal of successive metal layers, each about 0.0002 in. thick, until an underlying surface is reached where element percentages are the same as for the original heat. Readings on intermediate layers provide desired information on surface changes.

Another special problem is sorting mixed welding rod stock according to basic analyses. In this case the task is easily handled because rods are small in diameter and can be inserted directly into the X-ray spectrograph specimen holder compartment.

TEST SPECIMEN: Researchers A. M. Reith and Robert Graf study alloy casting developed for variety of test purposes.

X-RAY CHECK: Simple and fast. Spectrograph operator merely inserts prepared specimen in holder, places in test machine and reads results.

Cold Reduction Saves Time, Cuts Waste

The closer a machining blank can be formed to the finished dimensions, the easier will be the machining job.

Especially so with a new process that forms multi-diameter shaft blanks.

The benefits come in large-scale production.

■ Savings up to one ton in every three in the mass production of multi-diameter machine shafts result from a new method of cold reducing hot-rolled steel bars. Known as Republic Die-Form, the new process, developed by Bolt & Chain Div., Republic Steel Corp., Cleveland, produces carbon, alloy or stainless steel blanks.

By closely outlining the shape and size of the finished part, the blank requires just a finishing cut and/or grinding to complete the job.

Blanks made by the reduction method take the place of conventional bar stock in sizes up to 42-in. length and 2-in. diam. It permits major savings in time, steel and money in mass produced shafts.

Push Instead of Pull—The principle involves pushing dies over the blank from opposite ends to the desired distance and stripping them off again. The operation is repeated on either or both ends if further reductions are required.

Much greater reduction can be made by pushing, rather than pulling as in the case of cold drawing long bars. In attempting large reductions by cold drawing, the load required to pull the bar through the die may exceed the tensile strength of the bar and cause breakage.

Applicable to many parts produced by industry, the method was initially applied to transmission shaft blanks produced for an automotive company. At that time, the idea was not necessarily to reduce cost, but to conserve steel which was limited by allotment. By this means 200 tons of hot-rolled bars were made to produce the equivalent of 300 tons of cold-drawn bar stock.

SAVE BY BLANKING: Blank formed by cold reduction cuts down the amount of material and machining time needed to finish a shaft.

Wide Application—Today, applications for Republic Die-Form extend beyond the automotive field to farm equipment, appliances, electric motors. In producing a rifle barrel blank for a gun manufacturer, it saves 45 pct of the steel formerly required.

By virtue of the process, the producer of the final part cuts his machining time by decreasing the amount of material he has to remove. In addition, cost may be further reduced through decreased capital investment in machine tools, and elimination of excess weight-handling costs in raw material and scrap disposal.

In some cases the physical properties of the steel are improved to a greater extent than that of ordinary cold drawing. Republic Die-Form also improves the machinability of the bar. It can do away with the need for using resulphurized steel.

Economical only on 20,000 lb minimum orders, the process holds diameters to within 0.005 in. Lengths of the shoulders or step downs are held to within 0.0625 in. Straightness in some cases can be held to 0.005 in.

Analyze Steel Heats Quickly and Simply

Using a direct-reading spectrometer, steelmakers now analyze a heat in minutes. This lets melters check heats even before they're tapped.

▪ A tiny man-made rainbow helps the forging and casting section of Allegheny Ludlum Steel Corp. test heats of steel for analysis while the steel is still bubbling in the furnace.

The firm's Ferndale, Mich., plant has just completed installation and calibration of a Baird Associates direct reading spectrometer. This analyzes heats accurately, simply and rapidly.

How It Tests—A small sample is spooned from the furnace, poured into a mold and rushed to the laboratory. The sample is placed in the instrument; in 80 seconds the analysis of ten elements is recorded. Total elapsed time from spooning the sample to reporting the analysis to the melt department is eight minutes. The speed enables the melt group to get a desired analysis before a heat is tapped.

The melt sheets at the forging & casting division call for 34 different alloys covering the range from iron through tool steels and up to some grades of stainless.

Large Number of Heats—Due to the large number of heats cast at the plant, and the time necessary to perform normal analytical tests, it was formerly difficult for the chemistry laboratory to keep pace with the melting department.

In the spectrometer light is created by sparking an electrode against a sample. This light passes through a prism and is broken into a rainbow. Parts of this rainbow, which represent certain elements in the sample, are passed through

Tester inserts a specimen into the spectrometer for analysis.

slits onto vacuum tubes which record the light's brightness.

Light Becomes Energy—Brightness is dependent on the amount of the element present. The vacuum tubes transform the light into electrical energy. This is amplified and then recorded as the percentage of the element present.

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1006 Prairie, Sturgis, Michigan

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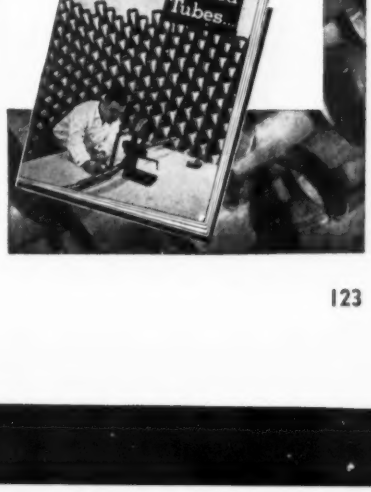
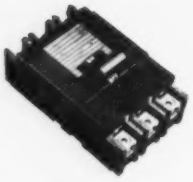
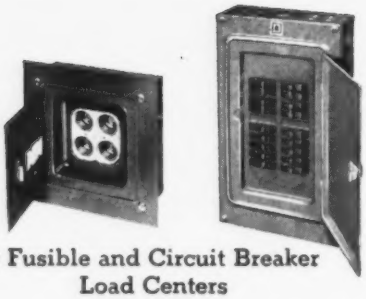


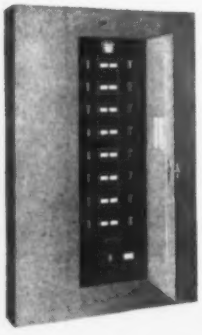
• Safety Switches and Industrial Circuit Breakers





• Fusible and Circuit Breaker Load Centers

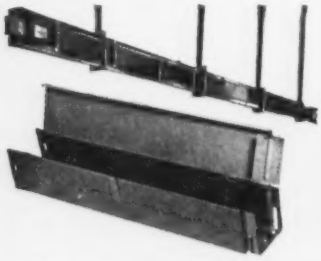
• Voltage Testers



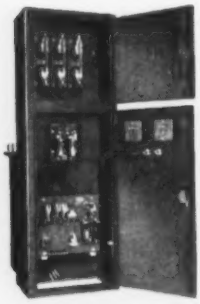
• Fusible and Circuit Breaker Lighting and Power Panelboards

• Power Distribution Switchboards and Switchgear

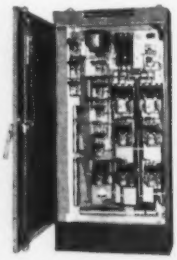
Wherever Electricity



• Busways and Wireways



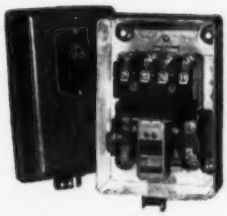
EC&M High Voltage and Synchronous Starters



• Special Purpose Control

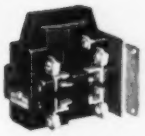
• Control Centers

SQUARE D COMPANY

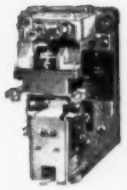


• A.C. Manual and Magnetic Starters

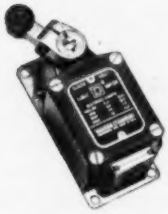
• Drum Switches



• Control Relays

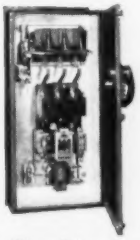


• Timing Relays

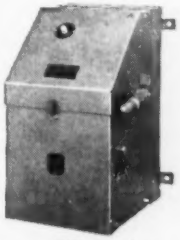


• Limit Switches

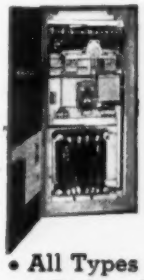
• Pushbuttons



• Combination Starters

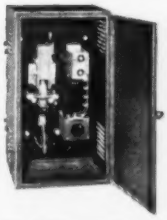


• Manual Compensators

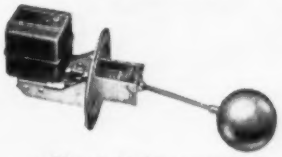


• All Types of Reduced Voltage Starters

• D.C. Starters



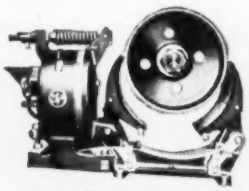
• Electronic and Electro-Magnetic Welder Control



• Float & Pressure Controls for Pumps & Compressors

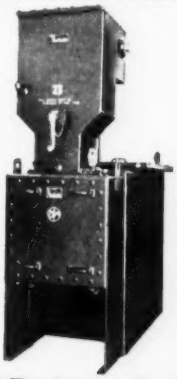
is Distributed and Controlled

EC&M Lifting Magnets

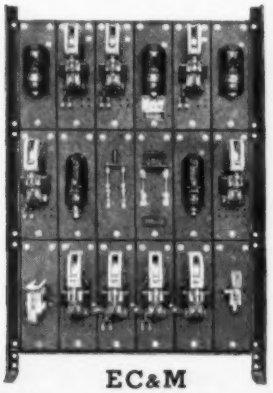


EC&M Magnetic Brakes

FIELD ENGINEERING SERVICE
available through Square D branch offices in all principal United States cities
... and in Canada, Mexico and England



EC&M Explosion-Resisting Control for Petroleum Industry



EC&M Crane and Mill Control

DESIGN LEADERSHIP FOR MORE THAN 50 YEARS

Bores Assembly Parts To Close Tolerances

Despite high precision requirements, finish boring of bearings and oil seals in rear axle housing assemblies is a smooth-running job at a Ford Motor Co. parts plant just outside Detroit. The finish boring operation on a special Excello boring machine is rather tricky because it's necessary to hold size to +0.001 in., —0.000 in.

Combining a "Better-Hold" chuck with a special cutter head, provided by Scully-Jones and Co., Chicago, eliminates many problems once encountered.

Chuck Is Unique—Parts being machined are SAE 1010 steel with 0.001 to 0.013-in. stock removal by the first tool, and 0.012 to 0.014-in. stock removal by the second tool.

The basic design of the chuck eliminates all clearance and play evenly along the chucking surface. It creates a powerful shrink fit on the shank or holder. Thus, the tool is held in position with a high degree of accuracy; the chuck also eliminates any tendency to vibrate or be off-center. With this tool setup, about 300 pieces per tool change are being worked, despite high-quality standards.

Off-limits Work Nil—Changing the tool is extremely simple; using a spare toolholder minimizes machine downtime. Because there is little time lost in tool change, there is no tendency to try to stretch out the time between changes; the result is the virtual elimination of off-limits work.

Boring unit operator places a toolholder in the chuck.

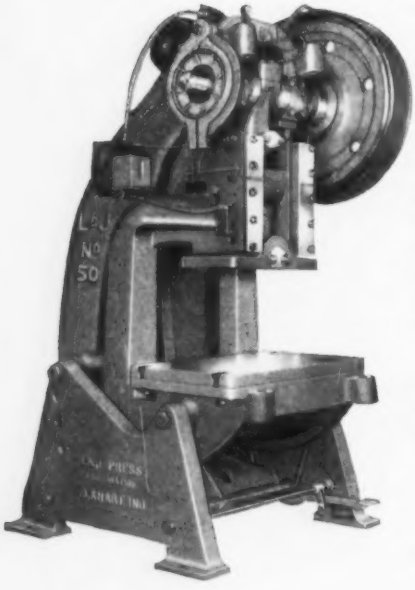
Carbide tool tip spares are kept at the machine. These are replaced in the toolholder body while the boring machine continues to operate using the other holder. Dull tool tips are gathered up and taken to the toolroom at periodic intervals for resharpening. They are returned to the machine for use as required.

Rolls Thin Strip

Recently developed techniques enable a strip producer to turn out high nickel alloy materials in thinnesses to 0.0005 in. ±0.0001 in. The producer, American Silver Co., Flushing, N. Y., rolls the ultra-thin,

L&J 50 SERIES

EXTRA CAPACITY WITH PRECISION TO MATCH



Large area dies are no problem when you have an L&J No. 50 Series press with its extra capacity. The exceptionally heavy frame provides maximum rigidity which enables the flanged, box-type ram to maintain precision alignment for precision jobs. The large work area will permit you to run a greater variety of work. Its dependability and tooling ease provide a new high in press efficiency.

Available in geared and non-geared models. Air clutch is available. It will pay you to get complete details now.

SPECIFICATIONS

Capacity: *Model 50*—50 tons, *Model 50B*—56 tons. **Shut Height:** 10" to 25". **Ram Stroke:** 3" to 8". **Ram Adjustment:** 3". **Ram Face:** 24" x 12". **Bolster Plate:** 36" x 24" x 2¼". **Throat Depth:** 12½". **Opening Thru Back:** 22". **Speed:** *Model 50* Non-geared—100 S.P.M., Geared—50 S.P.M. *Model 50B* Non-geared—95 S.P.M. Geared—46 S.P.M. *Higher speeds with air clutch.*

Write for Bulletin L-14

Describes L&J O.B.I. Presses. 23 Models, 14 to 90 tons, geared and non-geared. Also, 20 to 50 ton Double Crank, High Speed, Straight Side Presses.

L&J PRESS CORPORATION
1623 STERLING AVENUE, ELKHART, INDIANA

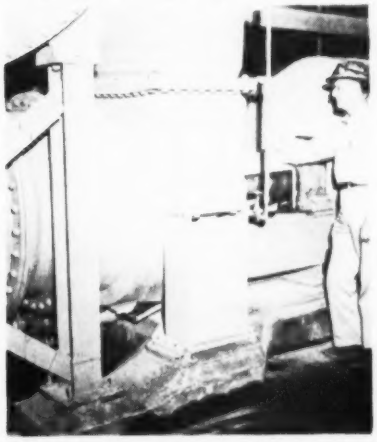
high-precision tolerance strip in temperature compensating, low expansion, high permeability, glass sealing and electrical resistance alloy types.

Stainless Castings Resist Corrosion

Where corrosion and elevated temperatures are problems, some users prefer one metal or material; others pick another. Of course, every application differs; each material offers its own advantages—and sometimes disadvantages, too —for each particular job. So it's smart to choose materials carefully, taking into consideration that all situations, as all materials, are not the same.

In selecting a material for use where higher temperatures and corrosive elements are present, it's wise to include stainless steel castings in your list of possibilities.

Attacks Pumps—Following this philosophy, engineers of Westvaco Chlor-Alkali Div., Food Machinery & Chemical Corp., South Charleston, W. Va., have successfully fought off attacks by one of the



This screw pump circulates very corrosive materials.

most corrosive elements known. Nine years of continuous exposure has left no sign on two stainless screw pumps used to circulate process liquor.

The large pumps are made from molybdenum-containing cast stainless alloy type CF-7M (Alloy

now you can get this brilliant finish directly on zinc die castings!

No electroplating--no mechanical finishing!

PART AS CAST

TREATED WITH NEW IRIDITE

NEW IRIDITE® (Cast-Zinc-Brite)

brightens zinc die castings by chemical polishing, protects against corrosion

NOW, FOR THE FIRST TIME you can get a brilliant, decorative finish directly on zinc die-cast parts . . . without mechanical finishing, without electroplating! The luster is provided by the *chemical polishing* action of new Iridite (Cast-Zinc-Brite) solution. Even surface blemishes, such as cold shuts, are brightened by this new process. No electrolysis. No special equipment. No specially trained personnel. Just a simple chemical dip for a few seconds and the job is done. And, this new Iridite has been *tested and proved* in production.

CORROSION RESISTANCE, TOO! New Iridite (Cast-Zinc-Brite) provides exceptional corrosion resistance for bright-type chromate finishes . . . also guards against blueing or darkening by eliminating zinc plate formerly required in bright chromate finishing of zinc die castings.

AS A BASE FOR ELECTROPLATING—Lower mechanical finishing costs are possible where plated finishes are *required* since the brightness provided by this new Iridite may be sufficient.

LET US SHOW YOU what Iridite (Cast-Zinc-Brite) can do for you. Send us at least a half-dozen typical zinc die-cast parts for FREE PROCESSING for your own tests and evaluation. Or, for immediate information, call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified 'phone book. *IMPORTANT: when you give us samples for test processing, please be sure to identify the alloy used.*

Iridite is approved under government specifications

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals

Casting Institute designation). They circulate a solution of sodium chloride having a specific gravity of 1.41. The liquor contains significant amounts of calcium and magnesium chlorides, with 8 to 10 pct sodium chloride crystals in suspension.

Parts Fail Quickly—In a smaller evaporator used previously, other pump parts failed in months; the best lasted only four to five years. Replacing parts didn't make the firm too happy; so they put the problem in the hands of the Zaremba Co., Buffalo. This outfit designed and built a new 180-in. diam, multi-circulation, double effect evaporator with screw pumps employing CF-7M alloy castings. This alloy has the same nominal composition as wrought type 316: 19 Cr, 9 Ni, 2.5 Mo, 0.07 max C.

Westvaco engineers report substantial savings in replacement and maintenance cost as a result of the increased life of the castings. They point out that the present life of the equipment is already more than double that of the best previously used material, at an increase in first cost of less than 10 percent.

Tiny Tool Solves Drilling Problem

Thanks to a new miniature tool, one manufacturer now drills once-difficult holes with production-line ease and efficiency. And the tiny drill saves the company time and money.

Employed by Micro-Lectric Div., Micro Machine Works, Inc., Roosevelt, N. Y., the firm uses the small

Drilling small, close together holes is easier with this tool.

tool in its production of potentiometer instruments. On each potentiometer, the company drills a series of tiny tap holes, often very close together.

Costly Old Way — Previously, the drilling job proved costly and time consuming; each drill had to be individually and carefully soldered to an extension rod. If a drill broke, the entire tool had to be discarded. Extra care taken to guard against breakage consumed considerable time. Then if the tool broke anyway, it meant even more time spent.

Like so many others, the firm became dissatisfied with the old

IT'S THE *MOST

ANNOUNCING
the Sensational NEW
miller
GOLD STAR
SR

It DELIVERS maximum arc stability for:
a. Sounder, denser welds – and more of them – in less time, with . . .
b. ALL electrodes, in . . .
c. Any and all positions

How is this performance possible? THE MILLER GOLD STAR SR introduces a . . .
NEW transformer
plus
NEW weld stabilized current
plus
NEW completely sealed semi-metallic rectifier

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Tested across the country by practical, critical, hard-bitten working weldors, here's what they say about the new Miller GOLD STAR SR:
"it's the DC performance I've always wanted"
"here's DC welding current that's . . . perfect!"
"positively handles ALL electrodes better"
"best deal I've seen for v and o work"
"easiet arc starting in my experience"
"smoothest arc I ever used . . . and . . . quiet!"
* "it's just plain the MOST"
Complete particulars on the MILLER GOLD STAR SR, including inert gas and automatic fixture welding, is now available on request.

". . . if it's Miller you know it's the finest . . ."

miller Electric Manufacturing Company, Inc.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD., Montreal

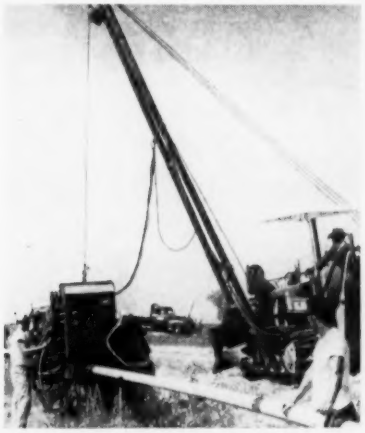
method. Looking for a better, less costly way, it called on Ritmar Corp., Huntington, L. I., for help. The latter developed a special problem-solving tool for the job.

Special Gripper Tool—The tool, a unique miniature drill setup, employs a special gripping mechanism. Inserting the drill into this permits quick, easy changing of dull or broken drills. No soldering, brazing or costly, special, small drills are not now necessary.

Of durable, strong, heat-treated tool steel, the drilling tool holds individual drill sizes ranging from No. 80 to 57 or 1/64 and 1/32 in. The tool has good concentricity and a uniform outside diameter (only ⅛ in.), allowing it to be used conveniently with drill bushings.

Automatically Welds Aluminum Pipeline

Aluminum pipelines can now be installed and welded at rapid rates. An improved automatic machine makes this possible. In final field tests the unit welded 2880 ft of



Tractor holds the unit as it rapidly welds pipeline.

pipe in four hours, with no supplemental hand welding needed at any point.

Working at a speed of 18 satisfactory welds every hour, the machine is the result of five years research by Reynolds Metals Co., Richmond, Va.

The original automatic welder was a joint development with Air Reduction Sales Co. Field tested in 1954, it was found a good piece of equipment. But Reynolds engineers thought it could use a number of refinements. Now, three years later, the machine — completely field tested—is ready for field pipeline application.

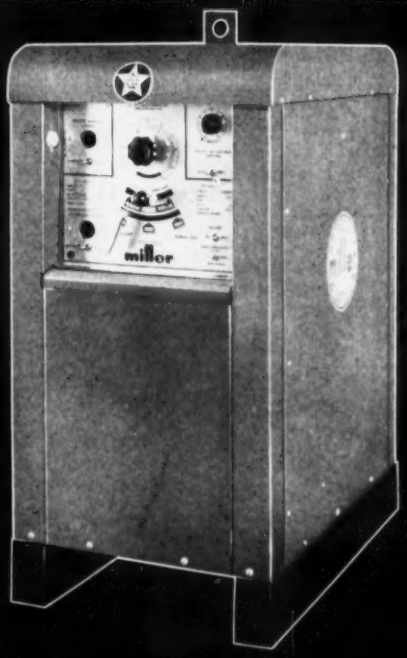
Four Basic Assets — Engineers working on the unit report four basic advantages for it: (1) It produces very good welds with consistent properties; (2) It's automatic, requires little welder attention; (3) Construction is rugged; (4) Joint to joint, its over-all operating speed is fast.

In physical form, the new machine is very similar to the 1954 device. The unit rotates around the pipe, carrying a shielded electric arc. At the same time inert gas blankets the area to be welded.

INTRODUCING THE

miller GOLD STAR 300 SERIES

GREAT NEW AC-DC ADDITION TO THE MILLER LINE



Here is the finest in inert gas and metallic welding

Complete particulars sent on request

miller ELECTRIC MANUFACTURING CO., INC.
APPLETON, WISCONSIN

distributed in Canada by CANADIAN LIQUID AIR COMPANY, Ltd., Montreal

Older Model Fast, Too — The older model made four-pass welds around the pipe in an average time of two minutes. Joint to joint time in welding pipe sections was a little more than four minutes. The machine is suspended from a side-boom truck or tractor.

Successful Field tests with the new unit have been carried out near Corpus Christi, Tex., and at Maracaibo, Venezuela. Reynolds is planning to use it in constructing a 42-mile, 6-in. diam aluminum pipeline in Colombia.

New Refractory Setup Cuts Furnace Delays

Furnace delays, caused by bank and bottom holes, take up less time when a new refractory gunning system goes into action. For tap holes repiping and the hot repair of basic openhearths, banks and bottoms, the setup supplies tap hole linings which last two to four times longer than manually applied mixes, its developer reports.

A product of Kaiser Aluminum & Chemical Corp., Oakland, Calif., the process has undergone extensive tests in openhearth shops.

Workers load refractory into a gunning unit's hopper.

No Batch Mixing — Key to the new setup is equipment that makes batch mixing unnecessary. The mix can be fed continuously through two hoppers which supply a main reservoir. At 40 psi the system shoots material accurately mixed with water at the rate of 200 lb per minute without pulsation or interruption.

In addition, the light, portable equipment can be folded to one side while fully loaded. This permits clearance for the charging machine. The mix used with the gun is made from refractory Periclase grains of 94 to 96-pct magnesium oxide. It ceramically bonds itself to a crystalline mass at relatively low temperatures in openhearth furnace bottoms and banks.

Ridley & Co., Inc., Los Angeles, makes the guns.

Extends pH Scale

The National Bureau of Standards has extended the temperature range in which pH standards are certified. Formerly the pH scale was accurately determined only

Now! Ajax SALT BATH FURNACES with REMOVABLE SUBMERGED ELECTRODES

What used to be a costly, time-consuming job now takes only an hour or two at the most. Labor cost is next to nothing . . . and there is little or no "down time" for the heat treating equipment because Ajax Removable Submerged Electrodes can now be changed without tearing down either the furnace wall or the pot.

Electrodes enter from over the top and slant into the salt bath. *There are no openings below the salt line.* A ceramic tile over each pair of electrodes seals off all air and eliminates corrosion at the salt line. *Thus, all the inherent advantages of submerged design are assured.*

To expose the electrodes for rapid removal, it is only necessary to lift the tile. The entire job can be handled by unskilled labor. Actual electrode changing time is less than an hour per pair.

Write for Bulletin 810 giving full details.

REPLACE AJAX REMOVABLE SUBMERGED ELECTRODES

. . . at absolute minimum labor cost
. . . without costly shutdowns
. . . without tearing down either furnace or pot

See it at the National Metal Show in Chicago, Nov. 4-8, 1957. BOOTH 1406

AJAX ELECTRIC COMPANY
904 Frankford Avenue, Philadelphia 23, Pa.
Associates: Ajax Engineering Corp.; Ajax Electrothermic Corp.

between 0 and 60°C. Now, however, pH samples are available from 0 to 95°C.

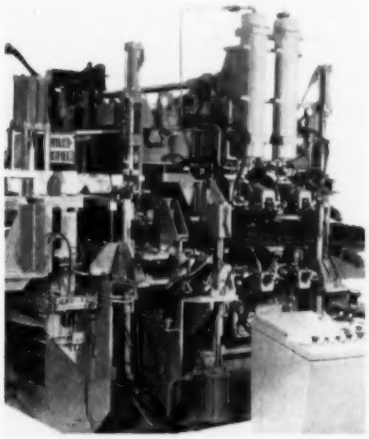
Seam Welder Joins Aluminum Strips

A special lap seam resistance welder joins successive strips of aluminum alloys for continuous processing at Aluminum Company of America, Alcoa, Tennessee.

The welder, designed and built by The Taylor-Winfield Corp., Warren, Ohio, handles alloys such as 61S, 24S and 75S from 0.010 to 0.080-in. thick. It joins strips as wide as 64 in.

Take Plain, Clad Strip—Either plain or alclad aluminum strip is fed into the welding machine prior to heat treating. A built-in shear square-cuts the trailing edge of one uncoiled strip and the leading edge of the following strip. Four welding wheels move across the overlapped edges, joining the two strips.

Two 250 kva transformers power the special welding machine. Mechanical transfer devices incorporated in the welder receive the strip, position it properly and move it towards the continuous heat treating line after it is welded. The operator controls all operations from a nearby push-button control station.



This welder is part of a continuous processing strip line.

Reviews Reactor Cost

Organizations going into nuclear research find that costs can vary widely, according to the user's needs. A book just released by the Atomic Energy Commission points this out.

The annual cost of operating a research reactor may range from as low as $15,000 annually for a fractional watt laboratory reactor to well over $200,000 a year for a 1000-kw pools reactor. These costs include items such as salaries of supervisory and operating staffs, heat and utilities, health physics service, maintenance, insurance, fuel, and amortization. Special facilities, AEC emphasizes, may cost nearly as much as the reactor; they can entail a comparable anneal operating expense, too.

The book is available from the Office of Technical Services, Dept. of Commerce, Wash. 25.

A NEW LINE OF DAKE *air hydraulic* PRESSES

FOUR NEW MODELS

25 TONS provides easy operation, low cost, and speed for general pressing and production work.

50 TONS for assembling, straightening, bending in minimum time.

75 TONS for handling heavy-duty press jobs quickly and easily. Ideal for machine shops, tool and die shops.

150 TONS for extra-heavy press work in heavy industry. This press is recommended for construction work, fabrication, and repair work requiring extra-heavy pressures.

CHECK THESE IMPORTANT DAKE FEATURES

√ **Rapid Ram Approach**—automatically changes to power stroke when it contacts the work.

√ **Movable Workhead**—self-contained, easy to center over work. Workhead can be purchased separately.

√ **Modern Design**—all of the operating controls are at convenient working height.

√ **Extra Long Stroke**—handles long pressing jobs more easily.

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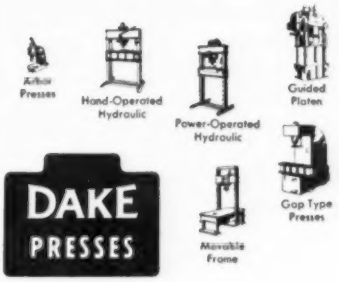

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New Production Ideas

Equipment, Methods and Services

Combination Grapple-Magnet Handles Scrap

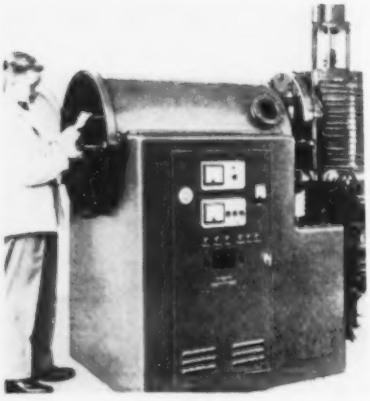
Scrap and other materials are handled safely and effectively via this combination grapple and magnet unit. Its maker recommends it for lifting scrapped auto bodies. Using tines specifically designed to penetrate deep into the bodies, the magnet-grapple grips tightly, transporting the scrapped item minus the hazard of unnecessary falling. In addition, this unit handles other baling material, too. It'll pick up and move small loose material, prepared scrap, or it may be used for yard cleanup. It can be used as a magnet alone, a grapple alone, or both at the same time. The combination weighs 3750 lb; the grapple alone, 2500 lb. When the unit is open, the reach across opposing tines is 96 in. Distance between adjacent tines is only 66 in. This permits use of a standard 8-ft truck body for unloading. (M. P. McCaffrey, Inc.)

For more data circle No. 41 on postcard, p. 141

Tri-point Micrometer Measures Bores, Holes

This unique tool measures inside bores and holes. Actually a sort-of three-point micrometer, the instrument quickly, easily and directly gives a reading on the inner diameters of tubing, pipe, small holes or deep bores. It's as easy to use as an ordinary micrometer, and as accurate. Even at considerably great depths, the tool—equipped with an extension—gives accurate measurement. Its three measuring points make line contact with the surface so that the instrument aligns itself axially and radially. Readings are, of course, direct; no master is necessary as with other measuring setups. It comes in several models; these have over-all ranges from 0.275 to 8.000 in. One obvious advantage of the tool is this: a single unit can replace many plug-type gages on some jobs. (Brown & Sharpe Mfg. Co.)

For more data circle No. 42 on postcard, p. 141



Plates Materials With Vaporized Metals

Economical plating of materials with vaporized metals is the job of this vacuum coater. Designed primarily for small or medium finishing setups, the unit has a production rate of five to seven cycles an hour. In a typical run, 400 to 600 1½-in. diam pieces are metallized per cycle. The coater's work chamber is a 30 x 45-in. horizontal steel tank with a hinged door at one end. All operating controls are cabinet-mounted and centralized near the sight spot. The standard pumping system consists of a 14-in. oil-diffusion pump, a 110-cfm roughing pump, and a 3.5-cfm holding pump. These pumps are interlocked to prevent burning of the diffusion-pump oil. Pump-down time with a clean, dry system is five minutes to 0.5 micron Hg. (Consolidated Electrodynamics Corp.)

For more data circle No. 43 on postcard, p. 141

Stud-Weld Gun

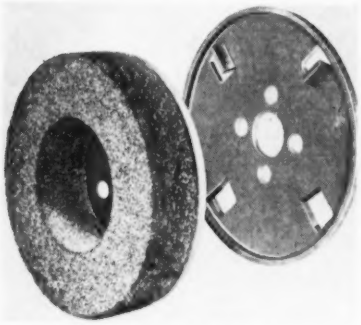
Light in weight, this small stud welding gun welds studs fast, reliably. The plastic gun is balanced so that it is as easy to handle as a hammer. Despite its small size, it

welds up to ½-in. diam studs. The gun weighs less than 4 lb; it measures only 9-in. long. (Nelson Stud Welding Div., Gregory Industries, Inc.)

For more data circle No. 44 on postcard, p. 141

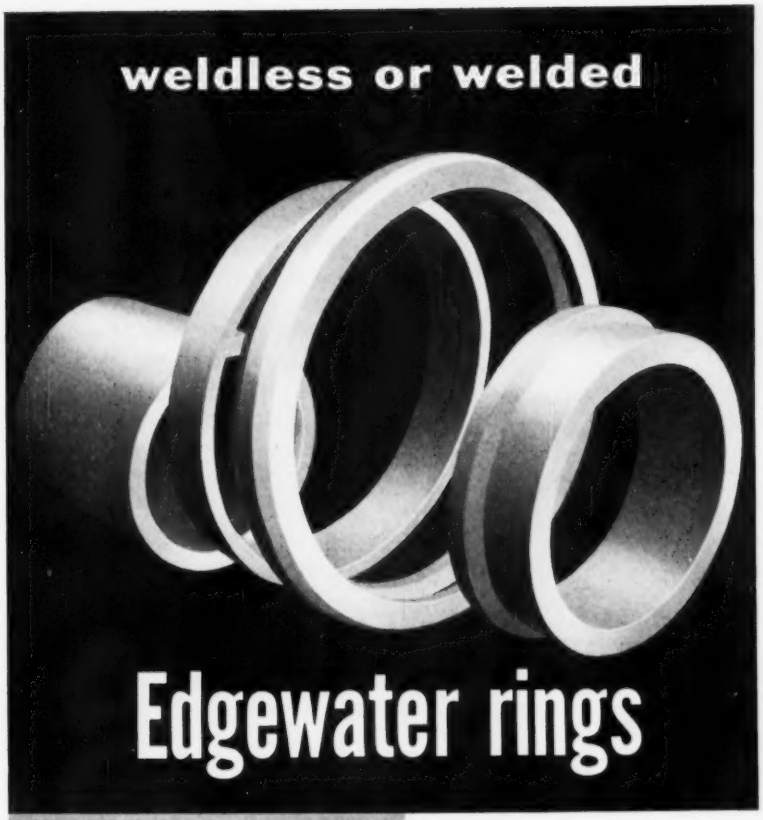
Grinding Wheels

Primarily for use on weld grinding machines—machines that require grinding wheels fitted, one side, with steel mount plates—are these new wheels. Normally, plates are attached to wheels by means of a chemical adhesive. These wheels



supplement the usual adhesive lock with a mechanical interlock. This securely locks the wheel to its mount with lugs keyed into the wheel, and angled so as to turn in the direction of the wheel's rotation. Sizes range from 7½ to 10 in. (Keystone Abrasive Wheel Co.)

For more data circle No. 45 on postcard, p. 141



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Edgewater weldless rings are made in diameters from 5 to 145 inches; welded rings in diameters up to 48 inches. Highest quality workmanship produces rings meeting the most exacting specifications.

Edgewater Steel Company

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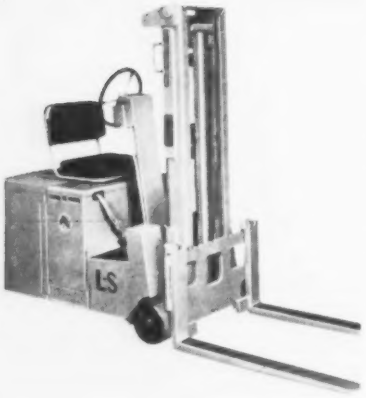
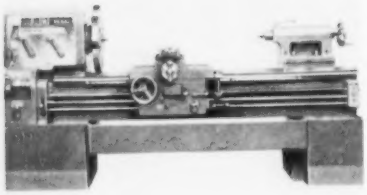


Fork Lift Truck Handles Heavy, Medium Loads

Completely new, this electric fork lift truck handles medium and heavy-duty jobs. Featuring a 24-v electrical system, it's especially designed for continuous operation, frequent stopping and starting. It's a rider-type truck run by a seated driver. The highly maneuverable unit turns in its own length; this is possible because of rear-wheel drive. Turning radius is just 56¼ in. It stacks goods in aisles as little as 9¼ ft wide with a 48-in. long load. The truck comes in four standard models: 1000, 1500, 2000 or 2500 lb capacities. Total operating weights are 3900, 3900, 4000 and 4400 lbs. Collapsed heights on all units are either 68 or 83 in., with 102 or 132-in. fork elevations. Fast lifting and traction speeds are key features. (Lewis-Shepard Products, Inc.)

For more data circle No. 46 on postcard, p. 141



Lathes Feature 10-hp Drive, Large Swings

Two new 21 and 24-in. lathes offer capacity, speeds and horsepower usually found in some heavier-type machines. Both models come with a standard 7½-hp motor —or they'll take an optional 10-hp unit for high speed ranges. Each employs an electric clutch and brake, feed reverse at the apron and heat-treated gears in the head. The bed has hardened and ground replaceable steel ways, fitted according to the compensating V-way principle. (The R. K. LeBlond Machine Tool Co.)

For more data circle No. 47 on postcard, p. 141

COPPERHEAD!
See these Copperheads, Harry? We're still not getting anywhere with our cleaning problem. I think I'll try Dick Relick at Pennsalt . . . he helped us straighten out our phosphate coating trouble last month, and he ought to have an answer for this.
Yes, in fact we've batted this all around our department. It's possible you're using too strong a cleaner for this job.
Too strong? Now there's a switch!
Cleaning before porcelain enameling isn't a cut-and-dried proposition. We think you need a mild, wetting-type cleaner built to penetrate this complex soil. We suggest you try a drum of Pennsalt 85.

Chart Records 100 Channels of On-off Data

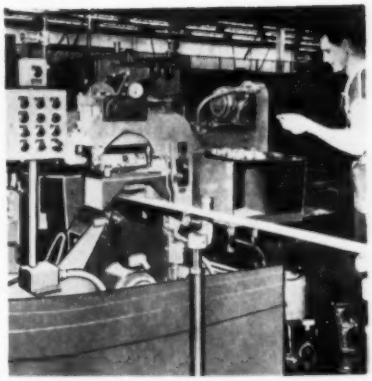
Instantly and simultaneously, this event-type permanent strip chart units records up to 100 channels of off-on information. Recommended by its makers for applications where off-on test data is required, the instrument indicates the events, the duration of events and their correlation with other events as a function of time. Off-on signals as short as one-thousandth of a second can be recorded. The moving chart is governed by an electrically-controlled transmission, giving the chart 16 fixed speeds in a chart speed range from approximately 10 in. per second to 10 in. per day. Speeds appear in millimeters per second or centimeters per hour. The transport mechanism has an accuracy of ¼ of 1 pct of line frequency. It employs a brush electric writing method with a response time of less than 100 micro-seconds to a change in signal. (Brush Instruments Div.)

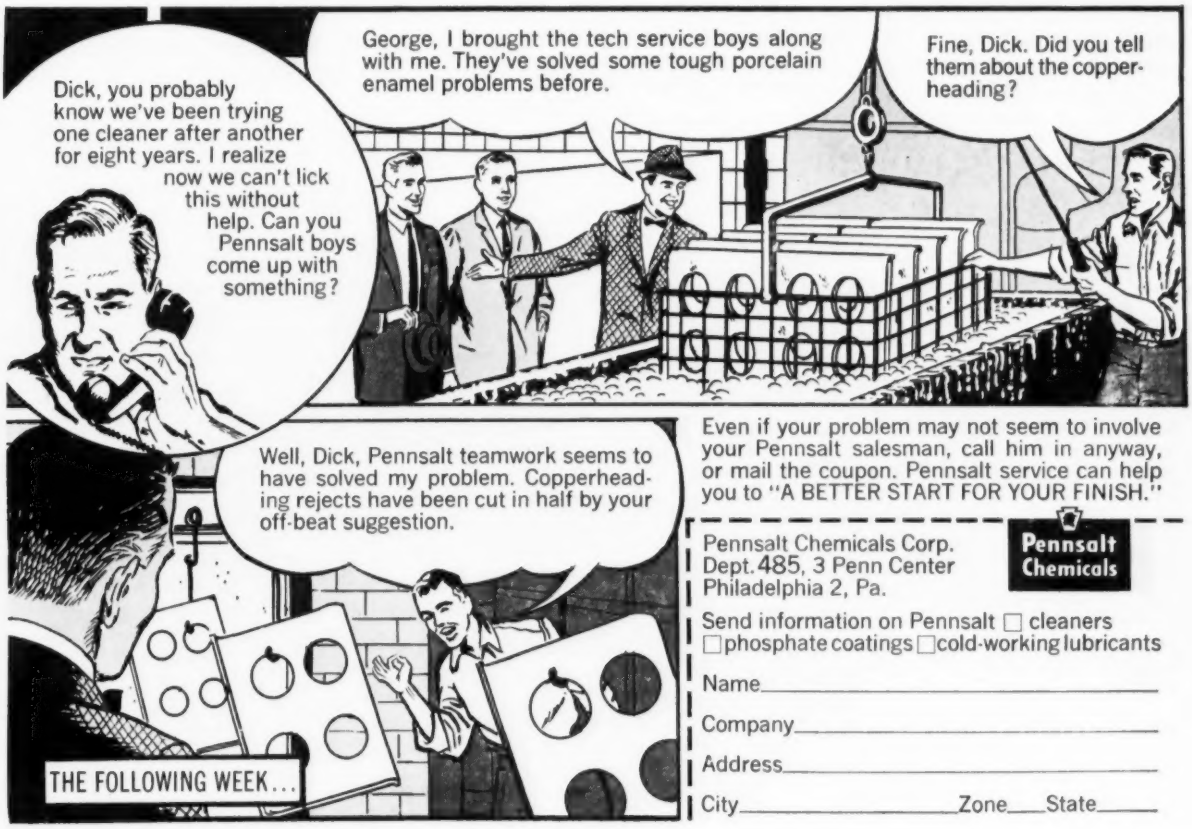
For more data circle No. 48 on postcard, p. 141

Machine Combines Gundrilling, Cutting-Off

This machine combines gundrilling and cutoff operations. Taking any type of bar or extruded stock, the rotary indexing type unit consists of two feeders and a standard index table. Actually, the machine performs several operations, including cutting-off and gundrilling. Working on extruded aluminum bar stock, a typical cycle sees the machine loading itself, automatically feeding, cutting-off, then indexing the cut-off piece to a broaching station, broaching the work, gundrilling it, countersinking and ejection. And the machine turns out parts with a 10 microinch finish on the hole. Production rate runs around 300 pieces per hour. (Avey Div., Motch & Merryweather Machinery Co.)

For more data circle No. 49 on postcard, p. 141




Dick, you probably know we've been trying one cleaner after another for eight years. I realize now we can't lick this without help. Can you Pennsalt boys come up with something?
George, I brought the tech service boys along with me. They've solved some tough porcelain enamel problems before.
Fine, Dick. Did you tell them about the copper-heading?
Well, Dick, Pennsalt teamwork seems to have solved my problem. Copperheading rejects have been cut in half by your off-beat suggestion.
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NEW EQUIPMENT

Pocket pH Meter

Many industrial problems involving pH control, acidity and alkalinity, can be quickly and easily resolved with a pocket pH meter now available. This small-sized instrument gives on-the-spot pH readings. Anyone can use the meter after reading brief simple instructions on back of the case. A unique feature of the instrument is its combination glass and reference electrode with a convenient 36-in. lead. This sensitive electrode may also be used while still clamped to the instrument's side, allowing the operator a free hand to make notations. The meter is 6 in. long, 3 in. wide, 2 in. deep and weighs only 2 lb. (Beckman Instruments, Inc.)

For more data circle No. 50 on postcard, p. 141

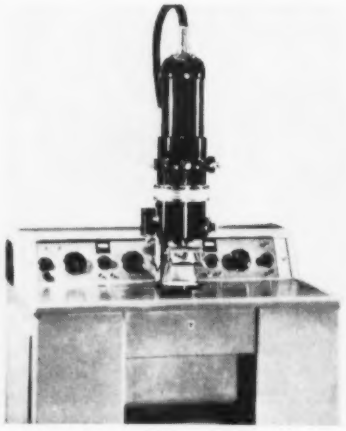
Flash Welder

An automated welder resistance-flash welds worms to ends of automotive steering gear shafts. Both parts automatically feed from loading chutes. It gages them and ejects them after welding. The welder incorporates a 150-kva transformer. (Federal Machine & Welder Co.)

For more data circle No. 51 on postcard, p. 141

Electron Microscope

This electron microscope for analytical work makes use of an objective lens with an externally adjustable mechanical compensator. This has a single control; it's indexed and coupled to double dipoles positioned on the face of the pole shoe.



Transmission electron diffraction patterns are obtained through a simple lens current adjustment. The new instrument permits stereo images to be produced by rotating the specimen rod under vacuum. Magnification is continuously variable and can be varied from 1200-12,000 diameters on the screen. Resolving power is better than 50

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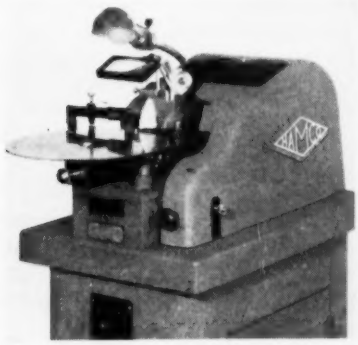
Angstroms. High voltage supply is continuously variable from 20 to 75 kv. Screen image is 90 x 90 millimeters at all magnifications. An image viewing magnifier (2x) mounted on a swivel or a binocular attachment (8x) with metal viewing chamber and camera are interchangeable accessories. Its film cassette accommodates up to 36 indexed exposures on film without changing the camera, or 8 plates with a metal viewing chamber and camera. Micrographs are 28 x 28 mm standard fine grain film or 3¼ in. x 4 in. glass plates. (Philips Electronics, Inc.)

For more data circle No. 52 on postcard, p. 141

Saw Sharpener

Circular metal cutting saws are automatically sharpened by this machine. It takes ½ to 14-in. diam blades, working teeth from the finest to two per inch. The unit is fast and accurate. Carbon and high speed steel blades are ground with equal ease. In fact, the machine may be used on all steels, brass, copper, bronze, aluminum, plastics and other materials. Arbors fit from ¼ to 1 in. diam hole sizes. Master in-

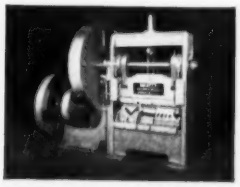


dexing makes possible making your own saws by cutting all new teeth with perfect concentricity; or you can even change the number of teeth in a saw to more or less per inch if desired. Sharpening six or seven saws at a time is also possible. However, its greatest advantage is this: you can automatically sharpen saws time after time with little set-up and operator time. (Hamco Machines.)

For more data circle No. 53 on postcard, p. 141

IN THE BEATTY FAMILY OF FINE METAL-WORKING EQUIPMENT YOU'LL FIND MACHINES FOR BENDING Z STRAIGHTENING — SHEARING FLANGING ⅂ V-BENDING ✓ PRESSING AND NOTCHING

BEATTY No. 7 Detail Flange Punch speeds single hole flange punching; eliminates end-for-end turning of beams. 100-ton cap.



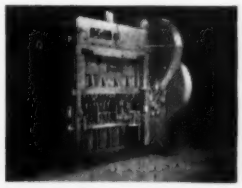
BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

Got a metal-working problem? Chances are, from the Beatty family of metal-working equipment you will find the *right* machine for the job. Right in cost . . . right in production speed . . . right in engineering concept.

Beatty machines have an enviable reputation for accurate, dependable, day-in-day-out operation. They're built rugged and rigid to keep downtime at a minimum — boost production. Don't let obsolete equipment rob *you* of production and profits. Get all the information on a Beatty installation to fit your needs . . . talk it over with a Beatty engineer.

BEATTY MACHINE & MFG. CO.
936 150th St., Hammond, Indiana

BEATTY Guillotine Beam Flange Punch for flange punching of beams. Built-in adjustable tools save set-up time. 200 ton cap.



BEATTY Guillotine Beam Punch punches webs and flanges in I-beams from 6 to 30 inches.

BEATTY Gap Type Press for forming, bending, flanging, pressing. 250 ton cap.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 141.

Wire Formers

Roll pointing machines for pointing nonferrous wire and rod preparatory to drawing through a die are covered in a bulletin. It describes both pedestal and bench type pointers. (Waterbury Farrel Foundry & Machine Co.)

For free copy circle No. 1 on postcard, p. 141

Spherical Bearings

Engineering data on spherical bearings and rod ends is contained in a bulletin. (Sealmaster Bearing Div., Stephens-Adamson Mfg. Co.)

For free copy circle No. 2 on postcard, p. 141

Micro Controls

Microswitches can provide precision control at low cost. With this theme, a folder lists and details several types of switches for control jobs. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 3 on postcard, p. 141

Flexible Coupling

In 12 pages, a bulletin describes a completely different flexible cushion coupling. It explains how the coupling—by means of a rubber tire element—accommodates angular misalignment, parallel misalignment and end float. The coupling does this singly or in any combination, besides cushioning shock loads and diminishing torsional vibration. (Dodge Mfg. Corp.)

For free copy circle No. 4 on postcard, p. 141

Oxy-acetylene Items

Oxy-acetylene flame's role in speeding ship repair and fabrication work is described in a 6-page booklet. Modern oxy-acetylene processes, such as flame-planing, rivet-busting, mechanized shape-cutting, and gouging are covered. Linde Co., div. of Union Carbide Corp.

For free copy circle No. 5 on postcard, p. 141

Architect Steel

New wide-flange shapes, 10 and 12-in. joists with 3-in. flanges have been added to one firm's line of steel architectural products. A catalog presents data on them. (Stran-Steel Corp.)

For free copy circle No. 6 on postcard, p. 141

Lathes

Lathes of every type, size and description are colorfully displayed in a unique piece of literature. It's packed with data. (Lodge & Shipley Co.)

For free copy circle No. 7 on postcard, p. 141

Low-heat Brazing

Low temperature brazing case-histories appear in a brochure. (Handy & Harman.)

For free copy circle No. 8 on postcard, p. 141

Aluminum Grating

Rectangular riveted aluminum grating is described in a bulletin. A

second publication lists various types of stair treads and grating now available from one company. The aluminum grates are light, strong, clean, rigid and corrosion resistant. (Klemp Metal Grating Corp.)

For free copy circle No. 9 on postcard, p. 141

Tool Steels

Facts about tool steels, their applications and heat treatment for the hot extrusion process are contained in a booklet. The 12-page catalog gives late, up-to-date technical data about tooling for the hot extrusion of metals. (Crucible Steel Co. of America.)

For free copy circle No. 10 on postcard, p. 141

Welding Tong

Cool welding tongs; that's what a 4-page folder describes. The tong is a fully insulated, 300 or 400-amp electrode holder. Key features: it's cool and comfortable for user, long lasting, low in cost. (Lincoln Electric Co.)

For free copy circle No. 11 on postcard, p. 141

Tubing Mechanical

An 8-page folder explains advantages of electric resistance welded mechanical tubing. It lists mechanical properties and available size tolerances. (Tubular Products Div., Babcock & Wilcox Co.)

For free copy circle No. 12 on postcard, p. 141

Lift Trucks

Two bulletins describe fork lift trucks; one is battery powered, the other, gasoline powered. (Baker-Raulang Co.)

For free copy circle No. 13 on postcard, p. 141

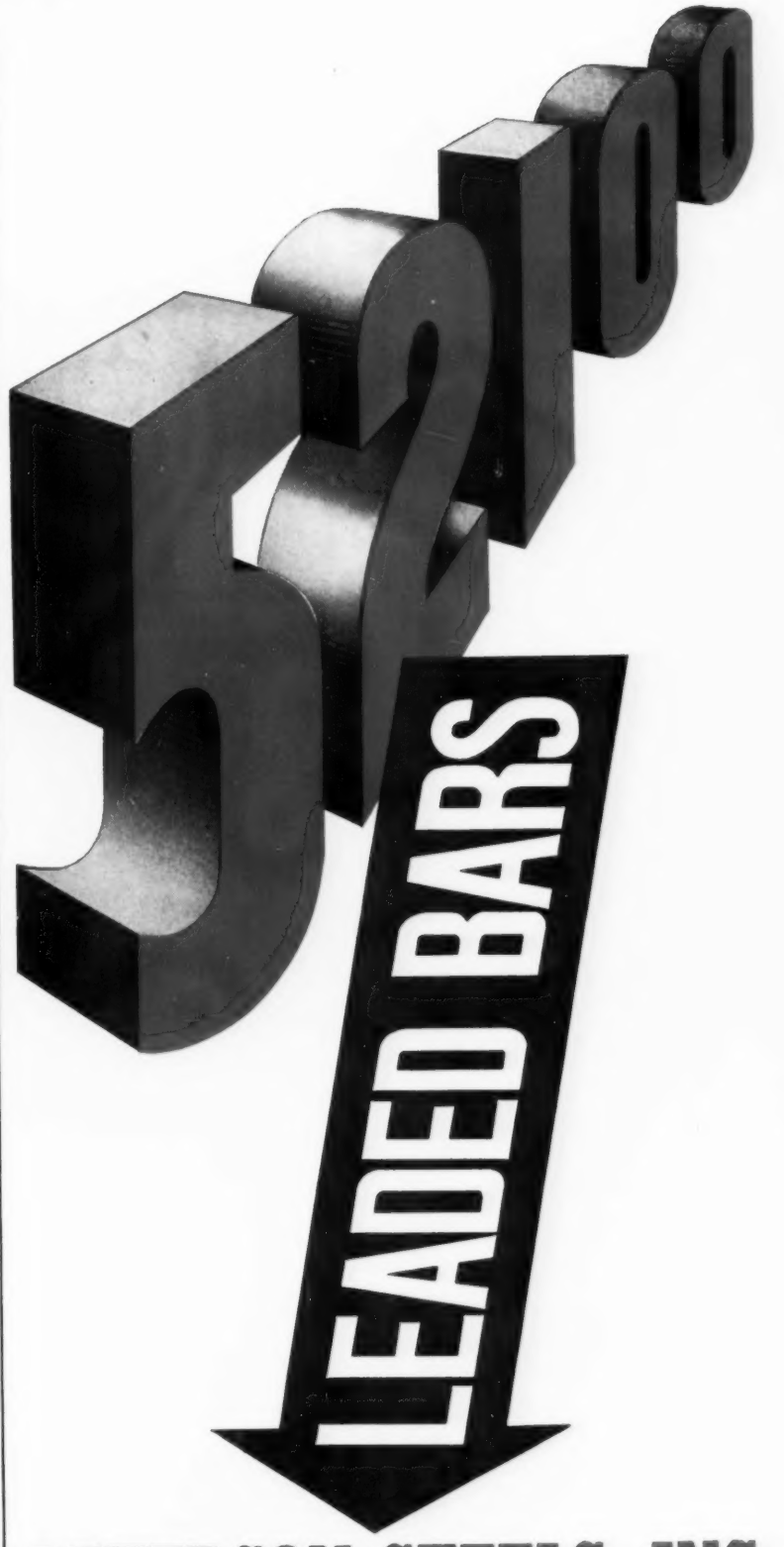
Welding Positioners

Headstock-tailstock welding positioners appear in a 12-page bulletin. It features eight models, capacities 5000 to 160,000 lb. (Aronson Machine Co.)

For free copy circle No. 14 on postcard, p. 141

Sealless Pumps

Sealless pumps are covered in a catalog. In eight pages, it offers use-



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Union, New Jersey • Detroit, Michigan • Chicago, Illinois

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A good example of our WELDING TECHNIQUE in connection with high alloy casting

This tube support is 21'6" long; 6'7" wide and weighs 8900 pounds. It looks like a single casting. Actually it is made up of three sections welded together in zig-zag strips across the face. It's a Duraloy HH casting destined for an oil refinery cracking still.

Welding is assuming greater and greater importance in the production of high alloy castings. Often it is the only way to produce large tonnage or unusually shaped pieces. During our many years of experience in producing both high alloy static and centrifugal castings, we have developed sound welding techniques for such castings. Carbon steel welding techniques won't serve. It takes special know-how for chrome-iron and chrome-nickel.

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DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

FREE LITERATURE

ful data on plastic and stainless steel models. (Vanton Pump & Equipment Corp.)

For free copy circle No. 15 on postcard, p. 141

Inert Gas

Inert-gas generators are outlined in a folder. These generators utilize direct contact cooling of the products of combustion from a high-velocity burner. They burn either gas or oil. (Thermal Research & Engineering Corp.)

For free copy circle No. 16 on postcard, p. 141

Boxcar Ramps

Extra heavy-duty welded all-steel ramps for double-door boxcars are described in a bulletin. Of 22,000-lb capacity, these ramps bridge the gap between car and dock. (Roll Rite Corp.)

For free copy circle No. 17 on postcard, p. 141

Clamps, Fasteners

A 16-page catalog includes information on a new gear-lock clamp. This uses a wormlike mechanism to provide air and moisture tight seals in heavy containers; it has closure strengths to 2000 lb. The brochure also lists other clamps and fasteners. (The Bassick Co.)

For free copy circle No. 18 on postcard, p. 141

Retooling Ease

Basic machines for automated, easy to retool, production operations are illustrated in a bulletin. It offers a brief review of how a basic unit can switch from heavy boring to multiple drilling or reaming, etc. (Baker Bros., Inc.)

For free copy circle No. 19 on postcard, p. 141

Neutron Shielding

Boral, a material for neutron shielding, is introduced in a 4-page folder. Such shielding is used in atomic power plants, other nuclear installations. (Brooks & Perkins, Inc.)

For free copy circle No. 20 on postcard, p. 141

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Magnet Grapple

Fast, easy handling of scrap, etc., is promised for a new combination magnet grapple. One big bite from this unit fills a baler, and it'll handle baled material, too. It serves as a magnet, a grapple, or both. A folder describes it. (M. P. McCaffrey, Inc.)

For free copy circle No. 21 on postcard

Dowel Pins

A catalog sheet gives specifications and data on dowel pins for bulk quantity purchase in packaged form. (Precision Steel Warehouse, Inc.)

For free copy circle No. 22 on postcard

Stampings and Forgings

Engineering and design, as well as production facilities, are covered in a 20-page booklet published by a company specializing in stampings and forgings. (Transue & Williams Steel Forging Corp.)

For free copy circle No. 23 on postcard

Precision Borer

A new folder describes how a precision borer gets hole spacing accuracy within 0.0001 in. for production center-drilling and boring.

For free copy circle No. 24 on postcard

Gear Production

A 4-page bulletin describes a gear maker's capabilities and facilities for gear cutting, gear tooth grinding, thread and worm grinding, heat-treating, grinding (cylindrical, internal, surface and centerless), deep hole drilling, precision reduction units for servo motors, and contract gear and gear train assembly manufacturing. (Norden-Ketay Corp.)

For free copy circle No. 25 on postcard

Welders

Spot and projection welders are reviewed in a bulletin. Both of these machines are air operated, press type, low impedance, single phase, designed to cover a wide range of commercial welding applications. (Sciaky Bros., Inc.)

For free copy circle No. 26 on postcard

Self-locking Bolts

Slotted-type, self-locking bolts are introduced in a catalog section. The product is a one-piece, cold-formed bolt featuring in its head design an elastic diaphragm; this furnishes additional elastic elongation when the bolt is tightened. (National Machine Products Co.)

For free copy circle No. 27 on postcard

Milling Machines

Plain and universal milling machines are illustrated and described in a wall-chart type bulletin. It covers: speeds, feeds, table size, rapid traverse speeds and other essential facts on capacity and operational characteristics. (The Greaves Machine Tool Co.)

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Roller Conveyor

A 4-page bulletin details a 2-in. diam roller gravity conveyor. The conveyor particularly adapts to handling objects that have one firm, free-running surface, such as boxes, crates, drums, cans, cartons, etc. (The Rapids Standard Co.)

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Silicone Rubber

Literature describes a new room-temperature vulcanizing silicone rubber. It's for sealing and caulking applications. (Dow Corning Co.)

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Materials Handling

Functions of an accumulator in the hydraulic system of an industrial lift truck are covered in a bulletin.

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FREE LITERATURE

When trucks are used over rough terrain, these devices reduce shock impact to the load and lifting mechanism. (Materials Handling Div., Yale & Towne Mfg. Co.)

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Cutting Tools

Practical cutting tool research results appear in a machine-tool maker's new 32-page booklet. It covers applications of modern lathe tool materials to production metal turning. Written from a practical, rather than a strictly theoretical point-of-view, it offers saving, production-upping, cost-cutting tips. (For free copy, write on company letterhead to The Warner & Swasey Co., Cleveland 3, Ohio.)

Pre-plating Cleaner

Reverse current cleaning of steel before plating is the subject of a service report. It explains how a particular composition combines high conductivity, good smut removal, controlled foamng, and long life in solution. (Oakite Products, Inc.)

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Coal-chemicals

Information on coal-derived industrial chemicals is included in new data sheets. These give not only specifications, properties and commercial data on many chemical products, but also pertinent economic information. (Industrial Chemicals Div., Pittsburgh Coke & Chemical Co.)

For free copy circle No. 33 on postcard

Job Shop

One firm's facilities for making standard and custom products is described in a booklet. Besides its regular lines (i.e., rivets, burrs, staples, etc.), the company produces special to-order items, made to specifications. The publication shows modern plant and equipment available to fill a wide range of ferrous and nonferrous product orders. (Cobb & Drew, Inc.)

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Investment Casting

Investment castings' advantages are outlined in a brochure. It mentions the care and precision demanded in the manufacture of investment castings. Casting steps are explained, too. (The Hitchiner Mfg. Co.)

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Machine Tool Control

Machine tool controls are discussed in a 24-page bulletin. It explains various continuous and intermittent positioning systems, hydraulic tracers, numerical controls and programming consoles. Also covered are accessory units such as hydraulic cylinders, power units, hydraulic milling spindles, coolers and mounting brackets. Profile, contour and straight line machine tool controls are illustrated. (True-Trace Sales Corp.)

For free copy circle No. 36 on postcard

Punches, Die Buttons

Ball lock interchangeable punches and die buttons are listed in a 66-page catalog. Also covered are: retainer plates, die sections, diemakers' supplies, plus technical data on die design and operation. (Acme Industrial Products, Inc.)

For free copy circle No. 37 on postcard

Welding Stainless

How to better weld stainless steels is told in a 20-page booklet. Intended for both experienced and less experienced welders, the guide is in question-and-answer form. (Arcos Corp.)

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Testing Machines

Hydraulic universal testing machines are described in a bulletin. These units come in standard and wide clearance models in capacities from 30,000 to 1,000,000 lb. (Tinius Olsen Testing Machine Co.)

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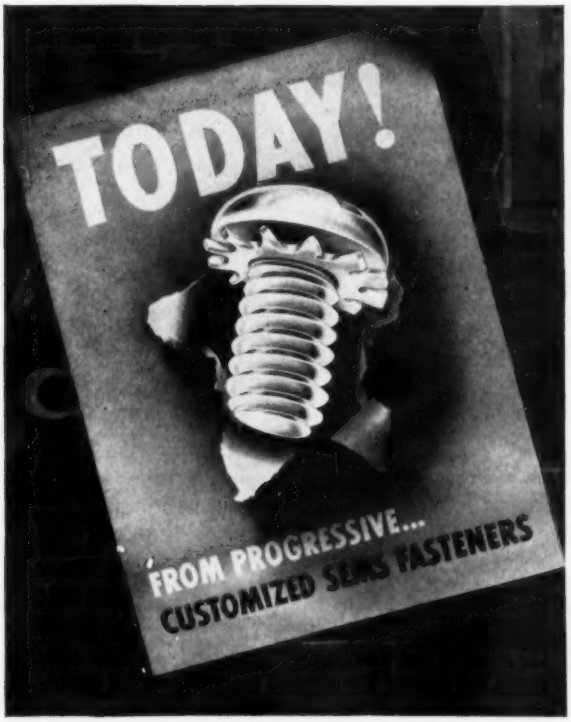

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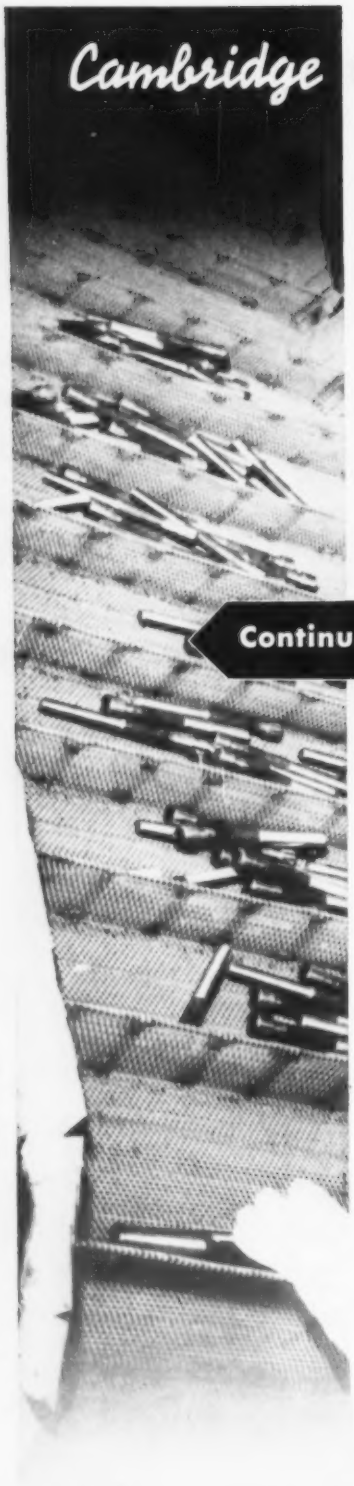

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Belt-to-belt flow of products through annealing, brazing, sintering, tempering, oiling or quenching operations at a controlled rate of speed increases production and assures uniform treatment of parts. By combining movement with processing, woven wire conveyor belts cut costs, eliminate batch handling, simplify operations. EXAMPLE:

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"Behavior of Metals at Elevated Temperatures" explains what happens to some materials when superheat hits them. It discusses effects of slightly above normal heat up to the highest practical working limits. In addition to telling how high temperatures affect both ferrous and nonferrous metals, it mentions ways to get good service out of certain materials under such conditions. 122 pp. 66 illustrations. $6 per copy. Philosophical Library, 15 E. 40th St., New York 16.

"Essential Strength of Materials" is a textbook intended primarily for college courses where calculus isn't a prerequisite. This makes it a nominee for use in industrial training programs where future technicians may have a background in only alegebra and trigonometry. Included are chapters covering: welded joints, simple stresses, centroids and moments of inertia. 261 pp. $4.75 per copy. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36.

"The Solidification of Castings" is a complete revision of an older work. In fact, it's four times the size of the previous one. So it's only natural that much of the data is up-to-date. Like the earlier edition, the book is helpful most to researchers and advanced technologists. However, some of it could make interesting reading for the practical foundryman. 406 pp. The Institute of Metals, 4 Grosvenor Gardens, London, S.W. 1, England.

"Engineering Manpower" asks the reader if he thinks engineering talents in general are being wasted. Without waiting for a reply, the multi-authored work answers itself with a hearty "yes." Then, it goes on to discuss the utilization of engineering and scientific manpower. Writing as businessmen for businessmen, nine graduate students of Harvard School of Business Administration act as a well-

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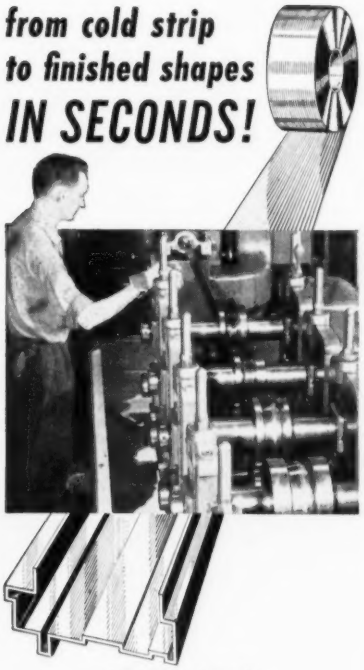

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"Work Simplification" deals with the science of getting more efficiency out of less effort. Authored by Gerald Nadler of Washington University, St. Louis, the book suggests to employers that the basic concepts of work simplification be known to everyone in the company. Thus, employees will get more done both at home and—most important—at work. 292 pp. $6.50 per copy. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.

"Servosystems Laboratory Manual" is for use by students in technical institutions. It covers feedback and servosystems. 32 pp. $2 per copy. Servo Corp. of America, 20-20 Jericho Turnpike, New Hyde Park, N. Y.

"Industrial Water & Industrial Waste Water" looks in two different directions in one volume. It discusses what pollutes water and how to stop this—and it tackles the problem of getting enough good water for industrial uses. A highlight of the symposium-based work is a paper on purification of sea water for power, steam, processing, etc. In this, O. M. Elliott, of Sun Oil Co., Philadelphia, analyzes briefly many methods of getting usable industrial water from the sea. Complexities and stumbling blocks get some attention. 52 pp. $2 per copy. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

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WE RAN this ad for a Corhart Electrocast Refractory a little over 25 years ago—back when only a handful of glass manufacturers would think of using this new product, "one of the world's highest-priced refractories". Yet today virtually every furnace in the glass industry uses Corhart Electrocast . . .

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The Iron Age Summary

Steel Stocks Are on Way Down

But industry sources say inventories will be about the same at year-end as last Jan. 1.

User stocks of sheet and bar have definitely been cut. Plate, structurals hold steady.

▪ Steel users will have about as much steel in inventory at the close of 1957 as they had at the beginning of the year.

But overall figures are misleading. Inventories of some steel products definitely are off. This includes sheets and bars. But stocks of heavier steel products — plates, structurals, and oil country goods —have held steady or been increased.

What Stocks Were — Industry sources estimate that last Jan. 1 user inventories stood at approximately 19.5 million tons. This figure includes steel shipped from the mills but not yet in the form of finished consumer products. It does not include finished products at the factory or in distributors' hands.

During the first three months of the year, inventories rose 3 million tons. And even in the second quarter stocks were up an estimated 800,000 tons. But even so, bar and sheet inventories were on the way down. The inventory cutbacks picked up speed in the third quarter, when some 2.5 million tons were lopped off.

What They Will Be—Steel inventory declines are expected to continue in the fourth quarter, but the pace has slowed. It's estimated that stocks as of Sept. 1 were about 20 million tons. So it's a good bet that overall steel inventories will about match those of last January as the year closes.

Meanwhile, the mills have been building up their stocks of semi-finished and finished steel. It's estimated that over 1 million tons were added in July and August. About half of this was a normal seasonal buildup of tinplate. This increase in mill inventories helped hold up the ingot rate during the summer months.

Record Output — In fact, steel output in the first nine months of the year set a record of 87.7 million ingot tons. This is nearly five million tons ahead of output during the same period last year. And it was more than 1.9 million tons better than the previous record of 85.7 million tons set in 1955. It's pointed out that 1956 production was hit by the 34-day steel strike.

Mill Buildup Ending—But the buildup of steel stocks at the mill level has just about run its course. Some sources say the stockpiling will have been completed by the end of this month and that ingot rates will reflect new orders only after that. One good reason behind the mill inventory buildup: Many steel users are buying on the basis of quick delivery. The mill that can deliver fastest gets the order.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,100	2,100	2,100	2,478
Ingot Index				
1947-1949=100)	130.7	130.7	130.7	155.5
Operating Rates				
Chicago	81.0	82.0*	82.5	102.0
Pittsburgh	82.0	81.0*	81.0	100.0
Philadelphia	85.0	85.0	89.0	104.0
Valley	67.0	67.5*	76.0	98.0
West	96.0	96.0*	100.0	105.0
Buffalo	97.5	100.0	100.0	105.0
Cleveland	90.0	86.5*	87.5	104.0
Detroit	97.0	99.0*	93.0	105.0
S. Ohio River	82.0	77.0	86.5	97.0
South	73.0	70.0	73.0	96.0
Upper Ohio R.	78.0	80.0*	99.5	106.0
St. Louis	95.0	82.0	77.0	103.0
Northeast	40.0	40.0	41.0	100.0
Aggregate	82.0	82.0	82.0	101.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$37.33	$39.33	$46.67	$56.17
No. 2 bundles	$27.67	$29.17	$36.34	$44.50
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	40.00
Lead, St. Louis	13.30	13.80	13.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	91.875	92.375*	93.75	106.75
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Scales Are Assigned New Duties

More and more the isolated scale is giving way to complete weighing systems which record data and control processes.

Currently the delivery outlook for both systems and standard scales is good.

■ "Each round of wage increases stimulates management's interest in automatic type weighing equipment." (Exact Weight Scale Co.)

"Because weight records affect the cost control picture the current trend is toward looking at weighing in terms of systems rather than isolated scales." (Toledo Scale Co.)

"Electronic or load-cell weighing will represent substantial improvements in the future. Such weighing . . . (will) render remote indication, remote recording, automatic programming of weight control, which mechanical elements could not equal." (Richardson Scale Co.)

"The industry is moving rapidly toward providing controls for automatically handling the weighing as well as controlling allied equipment such as conveyors. . . ." (Fairbanks, Morse & Co.)

More Than Weight Alone—That's the way four leading manufacturers of industrial scales view the future of their industry. And their comments are typical of the general opinion of scalemakers.

The day is ending when weighing merely means lugging material to a scale, noting its poundage, and then moving it again for processing or shipping. Today's emphasis is on tying the weighing operation right into the production process, obtaining data which can be recorded or transmitted to control or trigger other operations.

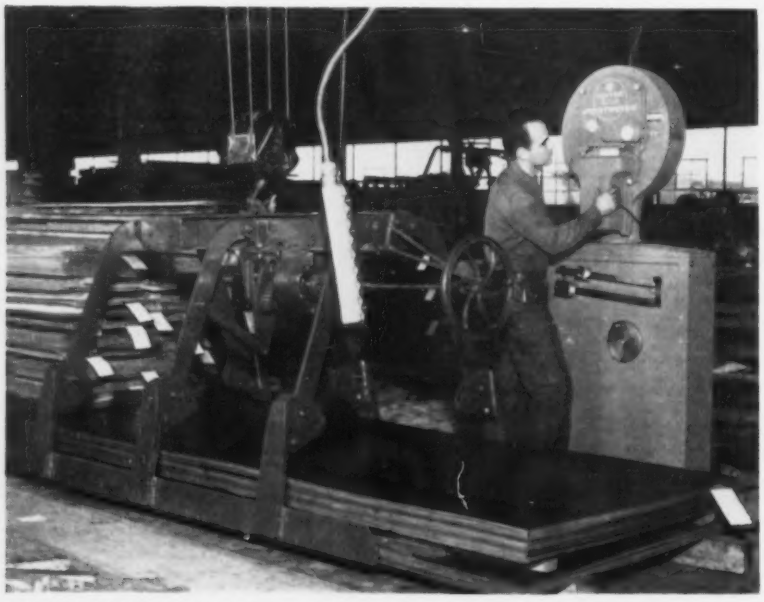
While not a new development the use of SR-4 load cells developed by Baldwin-Lima-Hamilton is growing in metalweighing applications. (See The IRON AGE, July 4 issue, p. 90; Sept. 19 issue, p. 148.) These devices—employing a bonded wire filament—transmit changes in electrical resistance when subjected to stress. This voltage change is then calibrated in terms of weight. Typical applications include the weighing of tanks, bins, hoppers and ladles, loaded railroad cars and in platform and crane scale installations.

Delivery Picture Good—Although the trend to specialized weighing and "control-by-weight" units naturally requires more time to design and build the equipment, the present delivery picture for buyers is good. Where such complete systems are involved, manufacturers have usually built up special engineering staffs to handle the buyer's requirements quickly.

Delivery prospects for standard scales are the best they have been since mid-1954, according to the Scale Manufacturers Assn. That's because the industry, after registering its largest volume year in 1956, has experienced some decline in new orders so far in 1957. As a result builder backlogs are down and manufacturers are selling hard.

Sales Upturn Expected — The present price outlook is also encouraging for customers. While some manufacturers put through increases earlier this year, the prospect for further price boosts is small.

The dip in new scale orders in the first half of '57, estimated by the association as around 5 to 6 pct below 1956 levels, probably reflects the general slowdown in capital spending for expansion. The latter half of this year is expected to bring an upturn in scale demand. One leading supplier predicts last quarter sales in '57 should about equal those of last quarter '56.



SHEET WEIGHS IN: Buyers interested in scales for metalworking applications will find the delivery outlook generally good. (Toledo Scale Co. photo.)

MACHINING PERFECTION always starts with the right steel

Pick exactly the right steel for any job from J & L's complete cold finished line

"Manufacturer saves three ways with J & L 1113 Bessemer steel"

This friction shaft part for a textile machine was converted to J&L "1113" Bessemer steel with these results:

- Time cycle reduced 20%
- Surface finish improved 20%
- Tool life increased 100%

Due to these savings, manufacturer is now using J&L "1113" steels for other applications. You can get similar savings in cutting speeds and tool life. Get facts from your distributor or write to Jones & Laughlin, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L STEEL

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Present Order Pace Will Hold

November flat-rolled business will about equal October's for many mills.

No market factors strong enough to stimulate more buying have appeared.

▪ It's a good bet that the present ordering pace—steady, but not spectacular—will continue through the end of the year.

Tally of November orders taken in by the flat-rolled mills indicates the month will about equal October. There's a difference, of course, depending on the mill consulted. But while some expect to better this month's order rate, others look for a slight drop in business.

No Change in Plans—Right now there are no market factors strong enough to disrupt the user philosophy of "delivery-to-use" buying. Because mills can offer quick delivery, the buyers continue giving them short lead times. The result: Producers, to keep operations up and provide fast service, are carrying large inventories of semi-finished and finished steel. Users, able to get what they want when they want it, are often operating on rock-bottom inventories.

The few products in strong demand—heavy plate, wide flange beams, large pipe—continue to form a select seller's market. Those previously weak—such as wire products, stainless, pig iron, butt-weld pipe—show no signs of life. And the items counted on by the mills to spearhead the fall upsurge—sheet, strip, and bar—haven't been able to do so.

Sheet and Strip — Belief that sheet sales will be slow to pick up is growing. Some mills are now wondering whether they will slide off. Automotive buyers are taking better tonnages. If new cars are well received, the improved tempo of automotive buying will continue into first quarter '58. Right now the feeling is that sales will stay at present levels through this quarter. Buyers other than automotive are still ordering hand to mouth. Several **Eastern** mills see November sheet orders not so good as October's unless last minute sales help.

Bar — New auto production schedules have boosted October bar orders for future delivery from **Cleveland** area mills by about 15-20 pct over September levels. Meanwhile, mills with the best delivery schedules, often the smaller producers, are using this advantage to get orders. Cold finished bars are being delivered in about 3 weeks with mill backlogs nonexistent.

Structurals—Supply and demand are coming into balance as fabricator backlogs dwindle. Even wide flange beams, long on the scarce side, should be more plentiful after this quarter, according to a large **Eastern** supplier. **Pittsburgh** mills see less pressure on them for structurals and plate at that time. **West Coast** users can now get standard structurals in 30 days or less.

An Eastern producer, Phoenix Iron & Steel Co., expects to resume operations at its Phoenixville, Pa., structural mill in "about 10 days," according to a company spokesman. The mill has been shut down since the beginning of September because of maintenance needs and the easier market for structurals.

Pipe and Tubing—Mills in the **Pittsburgh** area expect sales of oil country seamless to fall off mildly in the first quarter of 1958. Right now, the delivery picture varies. One mill, for example, is just making delivery on some types of large seamless pipe ordered in May and June.

Stainless—Quiet market remains. Users of special grades of stainless have cut their lead times to the mills down as low as 30 days in some cases in the **Midwest.** However, the normal time lag now is 6 to 8 weeks, as compared with 10-12 weeks a year ago

Billets, Blooms and Slabs—Market for forging blooms and bars continues weak with forging operations slow. Deliveries are rapid because mills have no backlogs.

Pig Iron—Many producers are able to provide rapid delivery to foundries operating on rock-bottom inventories. Some non-integrated producers are banking furnaces because of low business. However, those integrated with steel mills are absorbing merchant iron production in high hot metal charging of open hearths.

Iron Ore — Shipments through October 7 were 72 million tons for the Lake Superior district, running 15 million tons ahead of last year's totals, according to the American Iron Ore Assn.

PURCHASING AGENT'S CHECKLIST

Meet the thermal image camera—promising industrial tool. **P. 76**

The basic steps to better product planning. **P. 85**

ODM spells out its tool leasing policy. **P. 103**

COMPARISON OF PRICES

(Effective Oct. 15, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**: declines appear in *Italics*.

	Oct. 15 1957	Oct. 8 1957	Sept. 17 1957	Oct. 16 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.80
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.85
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.55
Special coated mfg. ternes	9.55	9.55	9.55	9.10
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40.75
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging, billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rod and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Oct. 15 1957	Oct. 8 1957	Sept. 17 1957	Oct. 16 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.75	11.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$38.50*	$40.50	$48.50	$55.50
No. 1 steel, Phila. area	*37.00*	38.00	45.00	56.50
No. 1 steel, Chicago	*36.50*	39.50	46.50	56.50
No. 1 bundles, Detroit	*29.50*	30.50	43.50	56.50
Low phos., Youngstown	*38.50*	41.50	53.50	64.50
No. 1 mach'y cast, Pittsburgh	*52.50*	54.50	57.50	59.50
No. 1 mach'y cast, Philadel'a	50.50	50.50	56.50	58.00
No. 1 mach'y cast, Chicago	*43.50*	44.50	48.50	57.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$37.33*	$39.33	$46.67	$56.17
No. 2 bundles	27.67	29.17	36.34	44.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17-18
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	27.00	40.00
Copper, Lake, Conn.	27.00	27.00	27.00	40.00
Tin, Straits, N. Y.	*91.875*†	92.375*	93.75	106.75
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	*13.30*	13.80	13.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	.....	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2,* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *J3;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1;* New Bedford, Mass. (.25¢ per lb higher), *R6;* Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1,* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa. *J2,* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3,* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R3;* Gary, *U1.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown; *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R3;* Munhall, Pa., S. Chicago, *U1.*

To identify producers see Key on p. 162

Trade States Case On Exports

Scrap men tell BDSA that domestic market will be off in 1958.

Trade says continued export at or somewhat over current rate won't seriously affect market.

■ The scrap industry has hopes that an easy scrap market will at least help in gaining some relief from export controls.

Spokesmen for the scrap industry, at a special conference with the Commerce Dept.'s Business and Defense Services Administration, stated they expected domestic demand for scrap to fall from a high of 37 million net tons in 1956 and 33 million in 1957 to between 28 and 31 million tons in 1958.

They also predicted export demand will remain at about the six-million-ton mark of the past few years. Dealers argued that there would be no need to continue present voluntary restrictions in 1958 because of the prospects of reduced domestic consumption. Restrictions are particularly effective holding down heavy melting shipments.

Even an increase of one million tons in export next year, which they say is unlikely, will not offset the dip in domestic demand, they contended.

BDSA plans to get the steel industry's side of the picture at a similar meeting soon.

Meanwhile, the domestic market continues to weaken, with virtually all markets down significantly. The No. 1 Heavy Melting Composite Price is $37.33, down from $39.33. The No. 2 Bundle Composite is $27.67, down from $29.17.

Pittsburgh — Prices are down again as the buying lull continues. No. 1 heavy melting is down $2, secondary openhearth grades are off $1. Dealers cannot replace scrap at prices being quoted, but the drop continues as mills show no sign of buying heavily. A late railroad list confirms the downward trend. Turnings and cast grades continue to slide.

Chicago—Industrial grades continue to show great weakness in the Midwest, and the entire list is off on somewhat confused buying. Mill offers of $40 for No. 1 heavy melting failed to draw scrap. Broker buying continued to run well beneath list prices. The market is further complicated since some brokers are beginning to hesitate to seek new orders in a period when scrap might begin an upturn. Heavy movement of distress tonnages continues to grow.

Philadelphia—Because prices are falling at a slower rate than in previous weeks, the trade is hoping the big skid is about over. Steelmaking grades dropped $1, based on a token tonnage purchase by one mill. Railroad specialties, with the exception of rail crops, dropped $2. Turnings grades were down $1. Export is still helping dealers pay their overhead expenses.

New York—Export has dwindled to where it no longer can support the price level here. Prices dropped off sharply for steelmaking grades, now reflect the domestic market, which is virtually nil. Unstripped motor blocks were incorrectly quoted in issues of Oct. 3 and Oct. 10. Correct price for both weeks should have been $32 to $33.

Detroit — The market continues its gradual slide. Local mills have yet to make any sizable purchases and dealers are getting restless. Most are resigned to the belief that the market is near bottom, but hasn't quite reached it. Last week, a mill paid $25 a ton delivered for No. 2 bundles, and there has been a little buying of No. 2 heavy melting at $29 delivered.

Cleveland—Complete absence of markets dropped prices another $3, with no sales in prospect. Mill purchasers like current prices, but most are still heavy with higher priced scrap. Some railroad tonnages have been withdrawn when sellers saw bids offered. Auto lists are expected to be larger next month, with no home in sight.

St. Louis—Some scrap is moving on old orders, but on a restricted basis. Demand is off and prices are down.

Birmingham — An Atlanta consumer purchased No. 2 steel scrap at $35 per ton. Although this price was more than competitive, some brokers feel the scarcity of scrap and dealer reluctance will make this order difficult to fill. Some electric furnaces entered the market for limited tonnages, which were quickly snapped up. Cast prices are gradually declining.

Cincinnati—The market is coasting on a few orders with no significant changes. Rail and cast grades settled slightly.

Buffalo—Business is at a virtual standstill here as the market continues very weak. Prices are off $2 on appraisal.

Boston — No scrap is moving here, to all practical purposes. There is little domestic or export activity of any kind. Most prices are off significantly on appraisal.

West Coast—There's a surplus of all grades of scrap except No. 1 and No. 2 heavy melting. Mills have big inventories, are taking only their reduced commitments. Very little exporting to Japan.

Fast, Dependable Scrap Handler Lowers Loading Costs

Bucyrus-Erie 38-B cranes offer a combination of features that get scrap out fast and economically. Independent power boom hoist permits the operator to change the boom angle at any point in the cycle. Instant, unvarying response from clutches and brakes means smooth, precise control for finest performance.

Moves between work sites in your yard are sure and easy. With boom lowered, the 38-B crane may be propelled with an overhead clearance of just 13 feet.

Adjustments are easy to make; machinery is arranged for speedy repairs, replacements, and lubrication. The load-lifting cycle is smooth, balanced, and coordinated.

For further information on the low-maintenance, smooth-operating features of Bucyrus-Erie 38-Bs, see your nearby Bucyrus-Erie distributor soon. He'll show you how these and other Bucyrus-Erie models point the way to greater profit in scrap. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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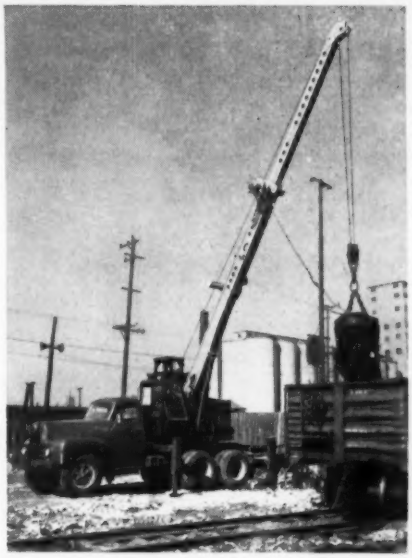

For handling scrap in hard-to-reach places or at scattered pick-up points, there is nothing finer than truck-mounted all-hydraulic Hydro-cranes. They're available in 5- and 10-ton capacity models.

BUCYRUS ERIE *A Familiar Sign at Scenes of Progress*

SCRAP PRICES *(Effective Oct. 15, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	38.00 to 39.00
No. 1 factory bundles	43.00 to 44.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and ms. turn.	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	43.00 to 44.00
Heavy turnings	35.00 to 36.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	60.00 to 61.00
RR steel wheels	54.00 to 55.00
RR spring steel	54.00 to 55.00
RR couplers and knuckles	54.00 to 55.00
No. 1 machinery cast.	52.00 to 53.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	40.00 to 41.00

Chicago

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	47.00 to 48.00
Low phos. punch'gs plate	43.00 to 44.00
Low phos. 3 ft and under	42.00 to 43.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	48.00 to 49.00
Rerolling rails	52.00 to 53.00
Rails 2 ft and under	51.00 to 52.00
Locomotive tires cut	48.00 to 49.00
Cut bolsters & side frames	48.00 to 49.00
Angles and splice bars	51.00 to 52.00
RR steel car axles	56.00 to 57.00
RR couplers and knuckles	47.00 to 48.00
No. 1 machinery cast.	43.00 to 44.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	36.00 to 37.00
Cast iron brake shoe	38.00 to 39.00
Cast iron wheels	45.00 to 46.00
Malleable	51.00 to 52.00
Stove plate	36.00 to 37.00
Steel car wheels	48.00 to 49.00

Philadelphia Area

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	27.50 to 28.50
No. 1 busheling	37.50 to 38.50
Machine shop turn.	21.00 to 22.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	23.00 to 24.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	33.00 to 34.00
Low phos. 5 ft and under	46.00 to 47.00
Low phos. 2 ft and under	47.00 to 48.00
Low phos. punch'gs	47.00 to 48.00
Elec. furnace bundles	44.00 to 45.00
Heavy turnings	33.00 to 34.00
RR steel wheels	55.00 to 56.00
RR spring steel	55.00 to 56.00
Rails 18 in. and under	68.00 to 69.00
Cupola cast	42.00 to 43.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	48.00 to 49.00
Malleable	58.00 to 59.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	50.00 to 51.00

Cleveland

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	34.00 to 35.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Cut struct'r'l & plates, 2 ft & under	41.00 to 42.00
Drop forge flashings	34.00 to 35.00
Low phos. punch'gs, plate	35.00 to 36.00
Foundry steel, 2 ft & under	36.50 to 37.50
No. 1 RR heavy melting	37.00 to 38.00
Rails 2 ft and under	59.00 to 60.00
Rails 18 in. and under	60.00 to 61.00
Railroad grate bars	19.00 to 20.00
Steel axle turnings	20.00 to 21.00
Railroad cast.	44.00 to 45.00
No. 1 machinery cast.	47.00 to 48.00
Stove plate	42.00 to 43.00
Malleable	55.00 to 56.00

Youngstown

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. plate	38.00 to 39.00

Buffalo

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	32.50 to 33.50
No. 1 busheling	35.00 to 36.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	29.50 to 30.50
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	21.00 to 22.00
Low phos. plate	41.00 to 42.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	57.00 to 58.00
RR steel wheels	44.00 to 45.00
RR spring steel	40.00 to 41.00
RR couplers and knucklers	40.00 to 41.00
No. 1 machinery cast.	47.00 to 48.00
No. 1 cupola cast.	42.00 to 43.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	28.00 to 29.00
Drop forge flashings	28.00 to 29.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos. punch'gs plate	29.00 to 30.00
No. 1 cupola cast.	35.00 to 36.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	31.00 to 32.00
Automotive cast.	39.00 to 40.00

St. Louis

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	20.00 to 21.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
No. 1 RR heavy melting	44.00 to 45.00
Rails, random lengths	51.00 to 52.00
Rails, 18 in. and under	63.00 to 64.00
Locomotive tires uncut	58.00 to 59.00
Angles and splice bars	50.00 to 51.00
Std. steel car axles	51.00 to 52.00
RR specialties	48.00 to 49.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	37.00 to 38.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	38.00 to 39.00
Cast iron car wheels	39.00 to 40.00
Rerolling rails	60.00 to 61.00
Unstripped motor blocks	37.00 to 38.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	29.00 to 30.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and short turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	19.50 to 20.50
No. 1 machinery cast.	34.00 to 35.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	29.00 to 30.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 dealer bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Clean cast. chem. borings	28.00 to 29.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks	31.00 to 32.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	23.00 to 24.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Bar crops and plate	41.00 to 42.00
Structural and plate, 2 ft	41.00 to 42.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	47.00 to 48.00
Rails, 18 in. and under	51.00 to 52.00
Angles & splice bars	47.00 to 48.00
Rerolling rails	55.00 to 56.00
No. 1 cupola cast.	47.00 to 48.00
Stove plate	46.00 to 47.00
Charging box cast.	27.00 to 28.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	38.00 to 39.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	21.00 to 22.00
Low phos., 18 in. and under	43.00 to 44.00
Rails, random length	54.00 to 55.00
Rails, 18 in. and under	62.00 to 63.00
No. 1 cupola cast.	36.00 to 37.00
Hvy. breakable cast.	33.00 to 34.00
Drop broken cast.	48.00 to 49.00

San Francisco

No. 1 hvy. melting		$39.00
No. 2 hvy. melting		37.00
No. 1 dealer bundles		38.00
No. 2 bundles		30.00
Machine shop turn.		27.00
Cast iron borings		27.00
No. 1 RR hvy. melting		39.00
No. 1 cupola cast.		$50.00 to 52.00

Los Angeles

No. 1 hvy. melting		$39.00
No. 2 hvy. melting		37.00
No. 1 dealer bundles		33.00
No. 2 bundles		25.00
Machine shop turn.		16.00
Shoveling turnings		20.00
Cast iron borings		20.00
Elec. furn. 1 ft and under (foundry)		50.00
No. 1 RR hvy. melting		39.00
No. 1 cupola cast.		47.00

Seattle

No. 1 hvy. melting		$42.00
No. 2 hvy. melting		40.00
No. 2 bundles		31.00
No. 1 cupola cast.		38.00
Mixed yard cast.		38.00

Hamilton, Ont.

No. 1 hvy. melting		$38.00
No. 2 hvy. melting		33.00
No. 1 dealer bundles		38.00
No. 2 bundles		28.00
Mixed steel scrap		33.00
Busheling		28.00
Bush., new fact., prep'd.		38.00
Bush., new fact., unprep'd		32.00
Machine shop turn.		20.00
Short steel turn.		23.00
Mixed bor. and turn.		21.00
Rails, rerolling		47.00
Cast scrap		50.00

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NONFERROUS MARKETS

Dull Market Looks To Detroit

General pickup expected in last quarter nonferrous sales hasn't materialized.

Industry hopes 1958 autos will go over big, and force automakers to boost buying.

■ An uneasy quiet has settled over nonferrous markets. Buying and selling has slowed noticeably.

The reason: Buyers and sellers are beginning to become apprehensive about the fourth quarter. For many it is the make-or-break period, and it just isn't working out according to the script.

Detroit Holds the Key—Right now all eyes are focused on Detroit. Nonferrous men are joining automakers in crossing their fingers. New models are being introduced, with the big sellers due to be unveiled shortly. The way many in the nonferrous industry see it, if the 1958 cars go over with the public it will mean 1957 will be a successful year. If not, 1957 sales and profits are sure to be far enough below 1956 to cause some concern.

Here's the story: Sales of all nonferrous metals in 1957 tailed off from 1956 right down the line—primary, mill shapes, fabricated products, and scrap. When production started outrunning demand at the beginning of the year, buyers pulled in their horns. They cleared out inventories of raw materials, buying as little as possible.

Pressure on Suppliers—Purchasing agents are demanding and getting immediate delivery from suppliers. Inventories of raw materials are at the lowest point in years, but purchasing men say as long as they can get immediate delivery there is no reason to rebuild them.

Seek Chain Reaction—With the possibility of an increase in industrial activity on a wide front generally conceded unlikely, many nonferrous men are hoping business from the automakers will be big enough and extensive enough to start a chain reaction. "If Detroit doesn't start buying soon, the year will finish about the same as it is now," says one copper seller.

Aluminum

Aluminum Co. of America has reduced its prices for electrical wire, both weather resistant and bare, an average of about 3¢ to 4¢ per lb.

Several sellers now admit that for some time the former list prices of these items were virtually meaningless. Severe competition had prompted just about everyone to discount almost every order.

Lead

Price of lead dropped ½¢ per lb early this week, to 13.50¢ at New York, 13.30¢ at St. Louis.

Sellers report the lower price did not stir up any new business. The market continues inactive.

Primary factors causing the fall were the wide spread between U. S. and London prices, and the news that Great Britain would sell 20,000 long tons from its stockpile beginning in December.

Magnesium

Primary ingot production, and wrought products shipments, in August reversed a two-month trend and took a slight upturn, reports the Magnesium Assn.

The fact that one of Dow's Texas plants was strikebound in August 1956 must be taken into consideration.

(short tons)	ingot output	wrought shipments
Aug. 1957	6958	770
July 1957	6598	714
Aug. 1956	3314	1262

Nickel

C. M. Schwitter, market research manager, International Nickel Co., reaffirmed the market appraisal of Inco president Wingate (The IRON AGE, Aug. 15, P. 51) that the nickel market is tending toward much better balance.

Mr. Schwitter told the industrial marketing section, New York Chapter of the American Marketing Assn., that increased world production and research should serve to convince even the most skeptical consumers that nickel can safely be considered for long-range plans.

Tin prices for the week: Oct. 9—92.375; Oct. 10—92.25; Oct. 11—92.00; Oct. 14—92.00; Oct. 15—91.875.*

*Estimate. Last week, prices quoted for Oct. 5 and 6 apply to Oct. 7 and 8 respectively.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8/1/57
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	27.00	26.50	9/3/57
Copper (CS)	26.00	25.50	9/13/57
Copper (L)	27.00	26.50	9/3/57
Lead, St. L.	13.30	13.80	10/14/57
Lead, N. Y.	13.50	14.00	10/14/57
Magnesium ingot	36.00	34.09	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	165-250	165-225	5/5/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig. Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 158.

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NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅝-⅞	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	108.1
AZ31B Spec.		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	49.13	.....	46.36	49.32
Brass, 70/30	43.02	43.56	44.26	45.93
Brass, Low	45.50	46.04	45.44	48.31
Brass, R L	46.37	46.91	46.31	49.18
Brass, Naval	47.27	.....	41.58	50.68
Muntz Metal	45.39	.....	41.20	.....
Comm. Bz.	47.78	48.32	47.72	50.34
Mang. Bz.	51.01	.....	45.11	.....
Phos. Bz. 5%	68.07	.....	68.57	.....

Free Cutting Brass Rod 31.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be.$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots .....$ 2.25
Cadmium, del'd .....$ 1.70
Calcium, 99.9%, small lots .....$ 4.55
Chromium, 99.8% metallic basis....$ 1.31
Cobalt, 97-99% (per lb) ....$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined .....39.50 to 53.50
Gold, U. S. Treas., per troy oz.....$35.00
Indium, 99.9%, dollars per troy oz...$ 2.25
Iridium, dollars per troy oz.....$86 to $89
Lithium, 98% .....$11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$232 to $235
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$23 to $24
Platinum, dollars per troy oz...$82 to $87
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.) 90.625
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium .....$ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.75
No. 120 ..... 26.75
No. 123 ..... 25.25
80-10-10 ingot
No. 305 ..... 31.75
No. 315 ..... 29.75
88-10-2 ingot
No. 210 ..... 39.25
No. 215 ..... 35.00
No. 245 ..... 31.25
Yellow ingot
No. 405 ..... 22.50
Manganese bronze
No. 421 ..... 25.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.25-26.00
0.60 copper max. 25.00-25.75
Piston alloys (No. 122 type)..24.25-25.00
No. 12 alum. (No. 2 grade) 22.00-23.00
108 alloy 22.25-23.00
195 alloy 25.25-26.75
13 alloy (0.60 copper max.)....25.00-25.75
AXS-679 .....22.25-23.00

(Effective Oct. 14, 1957)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅜	15⅝
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅜
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21
No. 2 copper wire 19½
Light copper 17¼
*Refinery brass 18⅝
Copper bearing material 18¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21
No. 2 copper wire 19½
Light copper 17¼
No. 1 composition 19¼
No. 1 comp. turnings 18¾
Hvy. yellow brass solids 13½
Brass pipe 15½
Radiators 15½

Aluminum

Mixed old cast. ..... 13½—14½
Mixed new clips ..... 16 —17
Mixed turnings, dry ..... 14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 19 —19½
No. 2 copper wire ..... 17 —17½
Light copper ..... 15½—16
Auto radiators (unsweated).. 12¼—12½
No. 1 composition ..... 16 —16⅛
No. 1 composition turnings... 15½—16
Cocks and faucets ..... 12½—13
Clean heavy yellow brass.... 11½—12
Brass pipe ..... 13 —13⅛
New soft brass clippings .... 13½—14
No. 1 brass rod turnings .... 11⅝—12¼

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 11 —11½
1100 (2S) aluminum clippings 14 —14½
Old sheet and utensils ..... 11 —11½
Borings and turnings ..... 7 — 7½
Industrial castings ..... 11 —11½
2024 (24S) clippings ..... 12½—13

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 50-55
Clean nickel turnings 45-50
Nickel anodes 50-55
Nickel rod ends 50-55
New Monel clippings 37-40
Clean Monel turnings 25-30
Old sheet Monel 35-38
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

Lead

Soft scrap lead ..... 9½—10
Battery plates (dry) ..... 4¼— 4⅛
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 15½—16
Siphon tops 42
Small foundry type ..... 13 —13¼
Monotype ..... 13 —13¼
Lino. and stereotype ..... 12 —12¼
Electrotype ..... 11 —11¼
Hand picked type shells ..... 8 — 8½
Lino. and stereo. dross ..... 3¾— 4
Electro. dross ..... 3 — 3¼

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.	$80.50 *N8*	$101.00 *N8*	$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8 P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.525 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.					5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.825 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Oct. 14, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro* *0.25* lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R5*	6.05 *T2, R5*	6.60 *T2, R5*						6.15 *T2, R5*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.
ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective Oct. 14, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.70 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.	5.65 *N8*	5.65 *N8*	7.65 *N8* 7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,13*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *J3* 7.50 *P8,B5*	6.475 *J3* 6.575 *G3*	8.775 *R3* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective Oct. 14, 1957)

† Merchant Quality—Special Quality 35c higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Oct. 14, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.74	T-1
18	4	1	—	5	2.445	T-4
18	4	2	—	—	1.905	T-2
1.5	4	1.5	8	—	1.10	M-1
6	4	3	6	—	1.49	M-3
6	4	2	5	—	1.245	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	$.525	6.50	6.975				
Cleveland *R3*							14.75
So. Chicago *R3*				9.75			
Ensley *T2*	$.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	$.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I3*	$.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B3*	$.525	6.50	6.975			6.60	
Lebanon *B3*			6.975		14.50		14.75
Minnequa *C6*	$.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B3*	$.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R3*				9.75			

COKE

Furnace, beehive (f.o.b.) Connellsville, Pa.	Net-Ton $15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Hermetic		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 80	19.20
Trans. 52	17.10	Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Oct. 14, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	173	187	..	212	193	8.65	9.20
Aliquippa *J3***	173	190			190	8.65	9.325
Atlanta *A8***	175			208	199	8.50	9.10
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4****							
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dav. *M4***	175	192	..	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	..	212	193	8.65	9.20
Duluth *A5*	173	187	..	212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187	..	212	193	8.65	9.20
Galveston *D4*	8.95‡						
Houston *S2*	178	192	..	217	198	8.90	9.45
Jacksonville *M4*	184-1	197	..	219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187	..	212	193	8.65	9.20
Kokomo *C9**	175	189	..	214	195*	8.75	9.30*
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192	..	217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210	..	..	213	9.60	10.15
Rankin, Pa. *A5*	173	187	..	..	193	8.65	9.20
So. Chicago *R3*	173	187	..	..	193	8.65	9.20
S. San Fran. *C6*†			..	236		9.60	10.15†
SparrowsPt. *B3***	175	..	..	214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179	..	..	..	..	8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *C4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 63

Rivets

Base per 100 lb

½ in. and larger $12.25

Pct. Off List

7/16 in. and smaller 19

Cap Screws

	Discount (Packages) *Full Finished H. C. Heat Treat*	
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk *Quantity*		
To ¼" diam. incl. — 25,000-200,000	9	54
5/16 to ½" diam. incl. — 25,000-200,000	9	54
All diam. over 3" long — 5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅜" diam. & smaller — 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	45.00
Electrodeposited	36.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	17.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	102.25
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	73.20
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 lb	59.00
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	12.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.20
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery†† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	$.10	8.38	8.88	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75		8.60	9.05	9.10	9.05	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	9.60	10.85	11.75	9.65	9.65	9.70	9.65	12.85	17.25	16.10	21.05	19.25
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25	9.85				
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00			8.40	8.35	8.70	8.45	10.70				
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		9.50	11.20	11.55	11.35	8.30†	9.65	9.65	14.65	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other or with galvanized sheets for quantity.

†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Oct. 14, 1957)

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 67.7% Cr, 1-2% Si... 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 26.50
0.025% C (Simplex) 36.75
0.10% C, 50-52% Cr, 2% max Si.... 35.50
8.00% max C, 50-55% Cr, 6% max Si 25.00
8.50% max C, 50-55% Cr, 3% max Si 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	13.00	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
		90% Si....	19.50

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

(Effective Oct. 14, 1957)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

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FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline
Diesel-Electric

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STANDARD GAUGE CARS
20 Cupola Caboose Cars
All-Steel Underframe

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6—Air-operated, 30-Cubic Yard, Drop Door
5—Austin-Western 1—Pressed Steel Car

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40- and 50-Ton Capacity

COVERED HOPPER CARS

15—70-Ton Capacity

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6,000- 8,000- and 10,000-Gallon
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"ANYTHING containing IRON or STEEL"

Sales Remain Slow At Pittsburgh

Used machinery dealers there, whose business depends on steel mill activity, are finding the equipment market dull.

Another contributing factor: the improvement in new machinery deliveries.

▪ Most Pittsburgh dealers report slow business. The degree of the lag varies with the dealer's dependence on the steel industry.

As an example of this, one machine tool dealer says there has been a pickup in inquiries in recent weeks. However, this dealer's business is more than 90 pct outside basic steel.

A large number of dealers in the Pittsburgh district are closely tied to steel. With mill operations under 85 pct of capacity, there has been a general slowing of business activity.

Good, but Reasonable—In addition, some feel the steel mills have large sums tied up in inventory. This fact, coupled with tight money supply, would tend to limit equipment buying.

A third factor in the lag is the improvement in new equipment deliveries. There are reports that smaller tools in standard models are available out of stock. This puts the emphasis on price in used machinery selling and dealers are having their usual problem finding suitable equipment at reasonable prices.

Welcome Home—In steel mill equipment, inquiries have lagged for the past month. Export demand is holding up fairly well with Latin American buyers particularly active and with bar mills attracting widest interest.

Reversing the usual flow in foreign trade, one dealer recently imported some rolling mill speed reducers. They were built in America. They have been used overseas and are now being brought back. The move reflects the difficulty in finding reducers to meet particular needs.

The importance of waterway travel in overseas trading was shown in a recent shipment to Denmark. A roller leveler was loaded on a truck in Pittsburgh. It was hauled to Cleveland and by ten in the evening was on a ship bound for Denmark.

What's Ahead—Outlook in steel mill equipment is for a pickup in the next 30 days.

In machine tools the outlook is spotty. The large tools are holding up reasonably well, according to a dealer who sells about 50 pct to basic steel and 50 pct to general metalworking. The smaller tools are lagging, says the same dealer.

He blames the lag on two factors. First he says new machinery deliveries have improved. Secondly, he says business in the summer months was surprisingly strong. He says the summer spurt has been followed by a reaction downward but that the next few weeks should see a pickup and the year as a whole will be a good one.

Same dealer says tool buyers are shopping hard for bargains. "They want late machines at the old machine price," he explains. Moreover, plants are bypassing dealers and doing more direct buying from other shops.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" Kling Pyramid Type
16' x ⅜" Ransome, Pyramid Type

BRAKES—LEAF TYPE
12' x ¼" Dreis & Krump
12' x ½" Dreis & Krump No. 228

BRAKE—PRESS TYPE
12' x ½" Cincinnati

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span	220/3/60
5 ton Cleveland	60' Span	115 Volt D.C.
8 ton P&H	55' Span	220/3/60
10 ton Shepard Niles	38' Span	440/3/60
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Shepard Niles	52' Span	230 Volt D.C.
15 ton Shepard Niles	55' Span	220/440 A.C.
15 ton Niles	55' Span	220/3/60
20 ton P&H	55' Span	220/440 A.C.
120 ton Shepard Niles	77' Span	220/3/60

CUT OFF MACHINE
#2A Modern Automatic Cut Off Machine For Pipe, Tubing, Bars to 2" O.D.

FORGING MACHINES
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 20,000 lb. incl.

HEADERS
#250C Manville Solid Die Single Stroke
#44 Waterbury Farrel DSOP, Capy. ⅝" x 6"

LATHES
24" x 23' Monarch
36" x 25' Niles

LEVELLERS—ROLLER
18" Torrington, 15 Rolls 2⅝" dia.
37" Torrington, 19 Rolls 1 31/32" dia.
54" Newbold 16 Rolls 4" dia.
66" Aetna 17 Rolls 4⅜" dia.

NAIL MAKING MACHINE
No. 00 National, Capacity ⅜" x 12" Spikes or rods

PLANER
72" x 72" x 16' Detrick & Harvey Four Head

PLANER—PLATE EDGE
35' Southwark, 16 Pneu. Jacks, Capy. 1½"

PRESSES—HYDRAULIC
500 ton HPM Fastraverse, Bed 36"x36"
1500 ton Bliss, 15" Stroke, Bed 49"x48"
1500 ton Mesta Steam Hydr. Forging Press
2000 ton Bliss 18" Stroke Bed Area 54"x55"
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE
100 ton Clearing F1100, 14" Str. Bed 36x36"
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44"x38"
250 ton Bliss #88 12" Str. Bed 29"x29"
250 ton Bliss #81 7½" Str. Bistr. 33"x39"

PRESSES—KNUCKLE JOINT
600 ton Clearing K-1600-36, 4" stroke, Bed 36"x36"
1500 ton Verson, 4" Stroke, Bed 48"x18", Architectural Jaw

PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy. 1¼"x1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
#7 Kling, 72" Throat, With Thomas Duplicator

ROLLING MILLS
6' x 5" Torrington Wire Flattening Mill Line
8" x 10" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 30" Farrel Two Stand Two High
20" x 36" Single Stand Two High
26" x 72" Cold Rolling Mill

ROLL—CORRUGATING
12" Stamco Rolls 24" Dia. Corrugations 2.66"

ROLL—PLATE STRAIGHTENING
72" Niles, 7 Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"

SHEARS—GATE
6' x 1" Hilles & Jones #6
12" x ⅜" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .020 Ga. Halliden Shear Line
53" x ⅝" Heavy Duty Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
10' x ¼" Cincinnati #1810
10' x ⅜" Cincinnati #2510

SHEARS—ANGLE
6 x 6 x ⅝ Hilles & Jones
4 x 4 x ⅝" Long & Allstatter

SLITTERS
24" Yoder Slitting Line
36" Paxon Slitting Line

STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Kane & Roach Roll Straightener & Cut-off, Capacities 7/16" to ⅝" Hex Bars

SWAGING MACHINES
#4 Fenn, Capacity 2¼" Tubing, LATE
#6½A Fenn, Capacity 2¾" Tube 3¾" Solid 10" Die Length Hydraulic Feed, LATE

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180 ton No. 27 Williams & White bulldozer
Cleveland cradle type uncoilers, hydraulic, MD, for coils 50" to 72" wide x 52" dia.
650 cu. ft. 17" x 10¼" x 12" Sullivan class WJ3 two stage angle compound compressor
20" swing No. 217 Baker Bros. box column heavy duty drill
20" x 72" Landis type D heavy duty plain hydraulic cylindrical grinder
53" x 24A Gardner vertical spindle horizontal disc grinder, MD
No. 18 Blanchard high power 36" dia. magchuck surface grinder
300 lb. No. 3C Chambersburg self contained pneumatic forging hammer
26" swing, 92" centers Bridgeford heavy duty selective geared head engine lathe
20" x 90" centers LeBlond geared head Timken bearing production lathe, hard ways
Model 6DREL Potter and Johnston single spindle manufacturing turret lathe
No. 4L Gisholt heavy duty saddle type turret lathe
34-36 Cincinnati duplex hydromatic mill, tracer controls
4-36 Cincinnati hydromatic bed type production mill
No. 2-24 Cincinnati simplex automatic production mill
4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine, 1000 rpm.
30" x 30" x 8' Cincinnati "Hypro-Planer" 2 rail, one right hand side head, dial feeds
200 ton No. 7 x 72" Bliss DC, SS, tierod frame, air clutch
88 ton No. 92½C Toledo DC, SS, tierod frame, DG, air counterbalances
800 ton Model 2E-48-800 Hamilton, SS, single crank, air clutch
750 ton No. 3 National Maxi-Press, all steel forging press, air clutch
7½" National High Duty air clutch forging and upsetter

Ask for latest list No. 207

MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
204 E. GENESEE AVE. SAGINAW, MICH.

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	Elliott		475	320
1	2250	Elliott		600	200/300
1	2300	G.E.	MCF	600	400/500
1	1750	Elliott		250	175/350
1	1375	G.E.	MCF	415	1300
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
3	800	G.E.	MCF	250	400/750
3	450	Whse.		550	415
2	300	G.E.	MPC	230	400
2	200	Whse.	CB-207.4	250	850/1200
2	125	Whse.	8K-190	230	450/1200
1	150	G.E.	CDBB	600	250/700
1	150	Cr. Wh.	65-H	230	1150
1	125	Whse.	8K-185	230	350/1050
1	125	Whse.	8K-183	230	850
2	100	Whse.	8K-181	230	450/1000
1	60/100	G.E.	BF-17	230	450/900
1	75	G.E.	CD-1231	230	850
2	75	Cr. Wh.	53HTEFC	230	860
1	50	G.E.	MD-412-AE	230	550
6	40	Rel.BB	385PTEFC	230	500/1500
2	30/40	Whse. D.P.	8K-131.5-BB	230	500/1500
3	(unused) 30	G.E.	CDM-85-BB	230	2200

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2500/4600
2	1000	G.E.	720	600	6800/13200
1	750	G.E.	720	125/250	2300/4600
1	500	Whse.	900	125/250	440
1	500	G.E.	900	125/250	440/2300
2	300	G.E.	1200	250	2300
1	300	Whse.	1200	275	440/2300
1	250	Whse.	1200	275	2300
1	200	El. Ma.	1200	250	2300/4600
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
1	3000	A.C.	OISC	3	33000 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4400
3	1000	G.E.	HVDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
1	833	G.E.	H	1	13800 x 460
2	750	G.E.	Pyranol	1	4800 x 83/55
2	500	Kuhl	OISC	1	13200 x 6600
3	500	Kuhl		1	4800/2400 x 240/480
1	300	G.E.	HT	3	4160 x 480/277
3	200	Al. Ch.	OISC	1	2300 x 230/460
3	150	G.E.		1	33000 x 2300/4000Y

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REBUILT — GUARANTEED
ELECTRICAL EQUIPMENT

COMPLETE PACKAGE MILL DRIVE IN STOCK

(1)—800-HP., Whse. motor, 168 R.P.M. 710 VDC, sep. excited fields
(1)—720/850-KW Whse. M-G Set 600/710 VDC Diff. Comp. driven by a synchronous motor 900 R.P.M., 4000/2300-volt, 3 phase, 60 cycle.
(1)—Starting panel for syn. motor
(1)—4 unit exciter set
(1)—Set of variable voltage control

IDEAL REEL DRIVES

(2)—600-HP Allis-Chalmers mill motors, 600-VDC, 300/600 R.P.M., with a 1200-KW, 600-VDC Westinghouse M-G Set, 1750-HP synchronous motor, 4160/2300-Volt, 3 phase, 60 cycle.
(2)—275-HP Westinghouse mill type motors, 230-Volt, 425/850 R.P.M., with 2 or 3-unit, 600-KW M-G Set, 250-VDC and 900-HP synchronous motor, 2300-Volt, 3 phase, 60 cycle.

SPECIAL

1450 KW double armature Whse. Generator, 600 VDC, 900 R.P.M. separate excited fields, with 2250 HP, syn. motor, 2300/4000 volt, 3 phase, 60 cycle.

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	D.C. Volts	A.C. Volts
5	1500	Al. Ch.	514	350/700	13800/8900/4160
5	1500	G.E.	514	250	2300/4000
1	1450	Whse.	900	600	2300/4000
3	1250	Al. Ch.	720	600	2300/4000
1	850	G.E.	720	240/350	2300
1	725	Whse.	900	600	2300/4000
1	500	Cr. Wh.	720	600	2300/440
1	500	G.E.	900	250	2300
4	300	Whse.	1200	125/250	2300
1	300 (3-unit)	Al. Ch.	1200	250/300	2300
2	200	Whse.	1200	125/250	2300/440
2	150	Rel.	1200	125	2300/440
1	150	Whse.	1200	125/250	2300/440
1	150	G.E.	1200	250	4600/2300
1	100	Whse.	720	125/250	220
1	75	Whse.	1200	125/250	2300

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Cable Address "Macsteel" Philadelphia, Pa. Phone Davenport 4-8300

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800 TON MILES WHEEL PRESSES
(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M. D.
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Phone PRescott 9-8996 N. Y. Phone LOngacre 3-1222

10' x 3/16" Cincinnati 18" Gap Power Squaring Shear, Front Operated Power Back gauge. 8' x ¼" Niagara Shallow Gap Power Squaring Shear, M.D.

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16 Ward St. Baker 5887 Rochester 5, N. Y.

1—34" REVERSING HOT STRIP MILL CONSISTING OF:

1—Slab re-heating furnace 44" wide x 93'4" long, 4 heating zones, oil and gas burners.

1—Mill drive motor, reversing, 2500 HP, 75/150 RPM, 600 volt D.C., with controls.

1—28" x 40" 2-high reversing mill having Morgoil bearings in roll stand, Timken bearings in pinion stand, universal spindles with carriers, 75 HP motor screwdown.

2—Re-heating coiling furnaces, each 50" wide, for gas or oil fuel, for coiling and uncoiling strip under tension while being rolled to thinner gauges.

1—Delivery table, 38" wide x 136'6" long, with anti-friction bearings. Speed 900 FPM.

1—Coiler 24" dia., driven by 100 HP, 485/1200 RPM motor. Timken bearings. Air push-off.

1—Coil discharge gravity conveyor 70'4" long.

1—Main motor-generator set for supplying reversing motor; also auxiliary generators.

All of the above equipment is in good operating condition, has been used very little. Further details will be furnished upon request.

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4000 lb. Chambersburg Double Frame Steam Forg. Hammer
2500 lb. Erie Single Leg Steam Forg. Hammer
Bliss Trimming Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
United Engineering & Fdry. Alligator Shear Clutch operated; Cap. 6½" Sq.
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' Pexto Gate Shear; 20" throat
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Single & Double End Punches
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No. 3 Waterbury Farrel Progressive Header, Cap. ½"; 4 stations and 1 Cutoff

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1—5000-H, 3730-KW, 13800 Volts (6900 volts), 3 Phase, 60 cycle, 514 RPM, 162 Amps., Allis-Chalmers Synchronous Motor with Class B Insulation, rated continuous at 40 Deg. C. Rise.
Each set equipped with a 40-KW exciter for synchonous motor fields, and a 10-KW exciter for generator fields, both 250-VDC at 514 RPM.
All mounted on a structural steel base approximately 27' long x 11' wide.
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400 pcs. BETH. BP-12—53 lb. 58' to 60'
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6x18" Landis Type C Hydraulic, m.d., late
6x18" Norton Plain Grinder, m.d.
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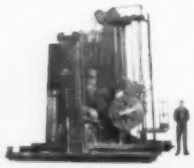

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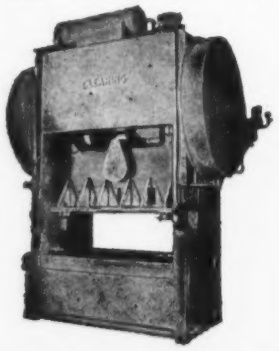

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A

*Acheson Colloids Co. 110
Ajax Electric Co., Inc. 130
Ajax Electrothermic Corp. 130
Ajax Engineering Corp. 130
Allied Research Products, Inc. .. 127
Allis-Chalmers Mfg. Co. ..44 & 45
Aluminium Limited Sales, Inc.... 28
*Aluminum Co. of America ... 138
American Screw Co. 24
Armel, James P. Co. 169
*Armstrong-Blum Manufacturing Co. 102
*Armstrong Bros. Tool Co. 157

B

Baker, J. E. Co., The 38
Baldt Anchor, Chain & Forge Div. 171
Baldwin-Lima-Hamilton Corporation Standard Steel Works Div. 32
Beatty Machine & Mfg. Co. .. 137
*Behr-Manning Co. A Division of Norton Company .....26 & 27
Belyea Co., Inc. 167
*Bellows Co., The 63
Benkart Steel & Supply Co. 168
Bennett Machinery Co. 167
Bethlehem Steel Co. 1
*Birdsboro Steel Fdry. & Machine Co 39
*Black & Decker Mfg. Co., The 57
*Brainard Steel Div. Sharon Steel Corp. 34
Briggs & Turivas 170
Bristol Brass Corp., The 4
Bucyrus-Erie Co. 153
Buffalo Forge Co. 29

C

*Cambridge Wire Cloth Co., The 144
Carco Industries, Inc. 172
Carpenter Steel Co., The Alloy Tube Division 98
Chicago Electric Co. 170
Cincinnati Cleaning & Finishing Machinery Company 11
Cities Service Oil Co. 105
*Clearing Machine Corp. Div., U. S. Industries, Inc. 100
Cleveland Crane & Engineering Co. The Steelweld Machinery Div. 41
*Cleveland Worm & Gear Co. 70
*Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div... 16
Continental Screw Co. 98
Copperweld Steel Co., Ohio Seamless Tube Division 106
*Corhart Refractories Co., Inc. . 146
Crawford, F. H. & Co., Inc... 167
*Cromwell Paper Co. 82
Crosby Company, The 19
Crucible Steel Co. of America . 47

D

*Dake Corporation 131
Davidson Pipe Co., Inc. 170
Davis Keyseater Co. 157
Donahue Steel Products Co. 168
Dony, D. E. Machinery Co. 168
Dulien Steel Prods., Inc. of Wash. 169
Duraloy Co., The 140

E

Eastern Machinery Co., The 169
*Edgewater Steel Co. 133
Electric Controller & Mfg. Co., The Division of Square D Company .....124 & 125
Erie Forge & Steel Corporation.. 67
Eveready Supply Co., The 170

F

Falk Machinery Co. 167
*Ferro Corp. 64
Ferry Cap & Set Screw Co., The 45
*Formed Tubes, Inc. 123
Foster, Frank B. Inc. 168
Foster, L. B. Company 10
Frank, M. K. 170
Fuller Co. 65

G

Gem Clay Forming Co., The .. 171
General Electric Co., Apparatus Dept. .....30 & 31
General Refractories Co. 13
*Gisholt Machine Co. .....50 & 51
Globe Trading Co. 168
Goodrich, B. F., Industrial Products Company 174
*Goodyear Tire & Rubber Co. Industrial Products Div. 8
Goss & DeLeeuw Machine Co. .. 157
Grass, Frank 172
Greenpoint Pipe Supply Corp. .. 170
Greist Manufacturing Co., The.. 171
Grob, Inc. 59

H

Hallden Machine Co., The 96
Hardinge Mfg. Co. 171
Hayward Company, The 157
Hendrick Manufacturing Co. .. 136
Henry, A. T. & Company, Inc... 167
*Holo-Krome Screw Corporation, The 37
Huebel Mfg. Co., Inc. 171
Hughes, Arnold Co. .....169 & 172
Hyman, Joseph & Sons 170
Hyman-Michaels Co. 170

I

Illinois Tool Works 55
*Ingersoll-Rand Co. 54
Iron & Steel Products, Inc. 166

J

Jones & Laughlin Steel Corporation 149

K

Keystone Forging Co. 171
Kingsbury Machine Tool Corp... 13
*Korn, William Inc. 136

L

*L & J Press Corp. 126
Lang Machinery Co., Inc. 168
LeBlond R. K. Machine Tool Co., The ..... 14 & 15
*Lehigh Safety Shoe Company .. 84
Link-Belt Co. 49
Lurie Bros. & Co., Inc 155

M

M. E. T. Equipment & Construction Co. 169
MacCabe, T. B. Co. .....167 & 168
*MacLeod Company, Inc. 64
Magnaflux Corporation 23
Merrill Brothers 171
Mesta Machine Co. Inside Front Cover
Metal Processing Machine Company, The, Subsidiary of McKay Machine Company 25
Metal & Thermit Corp. 95
*Michigan Tool Co. .....17 & 18
Miles Machinery Co. 167
*Miller Electric Mfg. Co., Inc. .....128 & 129
Moltrup Steel Products Co. .. 64
Morgan Engineering Co., The 42 & 43

N

*National Acme Co., The 77
National Business Bourse 1
National Machinery Exchange .. 168
National Steel Corp. 5
New Departure Div. General Motors Corp. 68
New England Pressed Steel Co. . 171

O

Ohio Seamless Tube Div. of Copperweld Steel Co. 106
Olson Manufacturing Co. 171

P

*Penn Metal Co., Inc. 33
*Pennsalt Chemicals Corp. 134 & 135
Peterson Steels Inc. 139
Pioneer Engineering & Manufacturing Co., Inc. 109
Pittsburgh Steel Co. .....52 & 53
Platt Bros. & Co., The 157
Power Equipment Co. 169
Press & Shear Machinery Corp. 169
Progressive Mfg. Co., The Div. of The Torrington Co. 143
Purdy Company, The 170

R

Reading Anthracite Co. 169
*Republic Steel Corp. .....20 & 21
Rosedale Foundry & Machine Co. 172

S

SKF Industries, Inc. 12
Sandvik Steel, Inc. 22
Sharon Steel Corp. 6
Signode Steel Strapping Co. 40
Simonds Gear & Manufacturing Co., The 145
Simonds Saw & Steel Co. 56
Singleton Machine & Tool Co. .. 169
Smith, Thomas, Co. 172
Southern Screw Co. 9
Square D Company, EC & M Division .....124 & 125
*Standard Pressed Steel Co. ... 62
Standard Steel Works Div. The Baldwin-Lima-Hamilton Corp. . 32
Standard Tube Sales Corp. 1
Stanhope, R. C., Inc. 168
*Steelweld Div. The Cleveland Crane & Engineering Co. 41
Sterling Grinding Wheel Co., Subsidiary of Abrasive & Metal Products Company 93
Struthers Wells Corporation, Titusville Forge Division 78
Swepco Tube Corp. 172

T

*Teiner, Roland, Co. 108
Timken Roller Bearing Co., The .. 80

U

Universal Machinery & Equipment Co. 168

V

Verson Allsteel Press Co. Back Cover

W

*Wagner Electric Corp. 34
Wallack Bros. 172
*Waterbury-Farrel Foundry & Machine Co. 66
Wean Engineering Co., Inc., The 35
Weatherly Foundry & Mfg. Co. 172
*Weirton Steel Co. 5
Weiss, B. M., Co. 168
Weiss Steel Co., Inc. 172
*Whiting Corporation 60
Wicaco Machine Corp. 171
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. .. 16
*Wiedemann Machine Co. 61
Wilcox Forging Corp. 172
Wilson, Lee, Engineering Co., Inc. Inside Back Cover

Y

*Yoder Co., The 145

CLASSIFIED SECTION

Business Opportunities 172
Clearing House 166-170
Contract Manufacturing 171-172
Employment Exchange 172
Equipment & Materials Wanted 172

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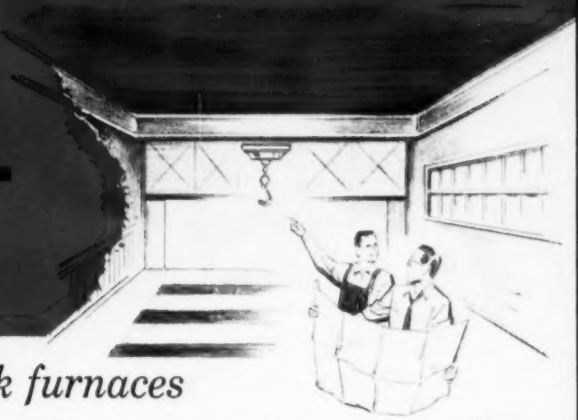

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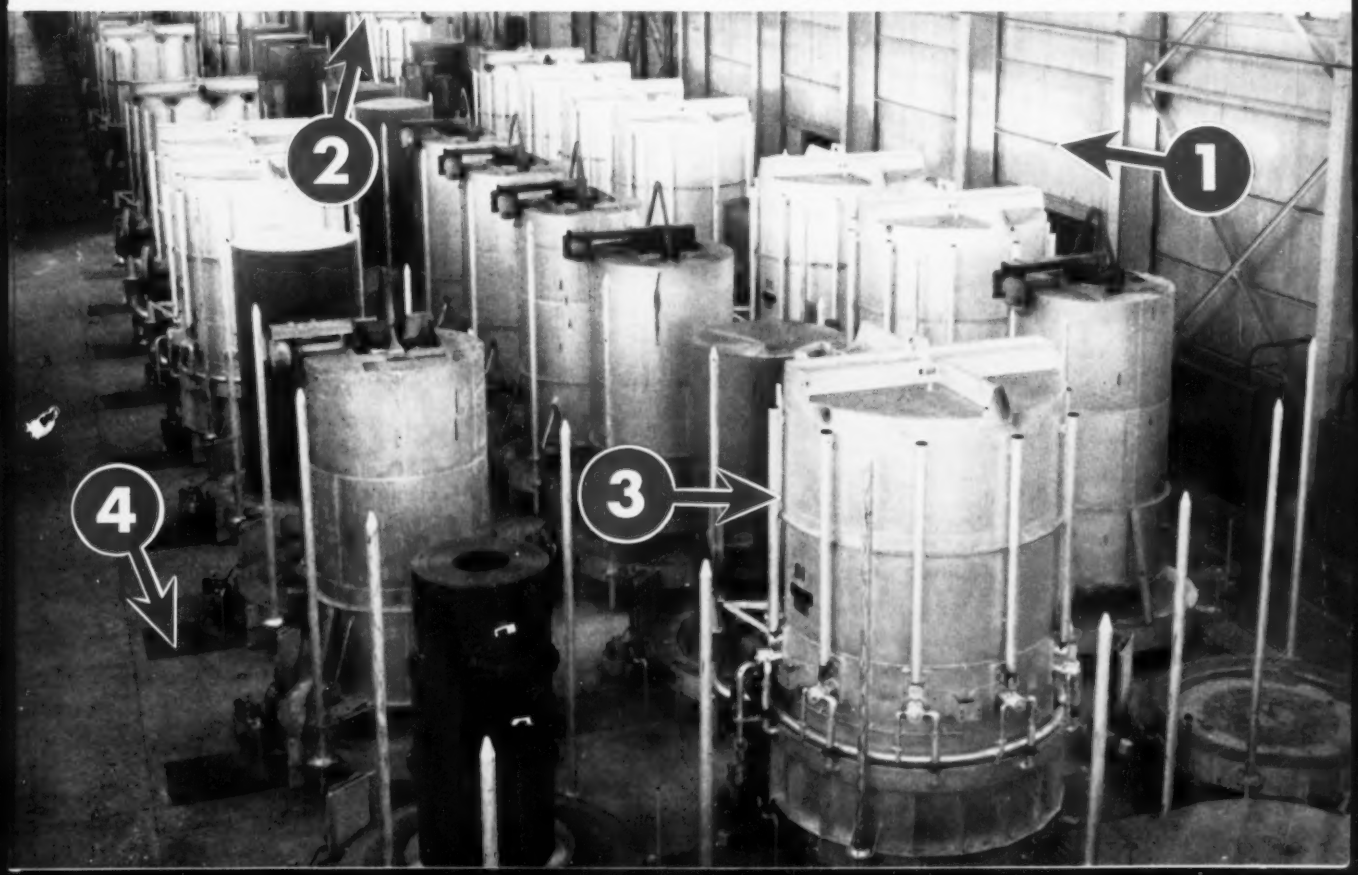

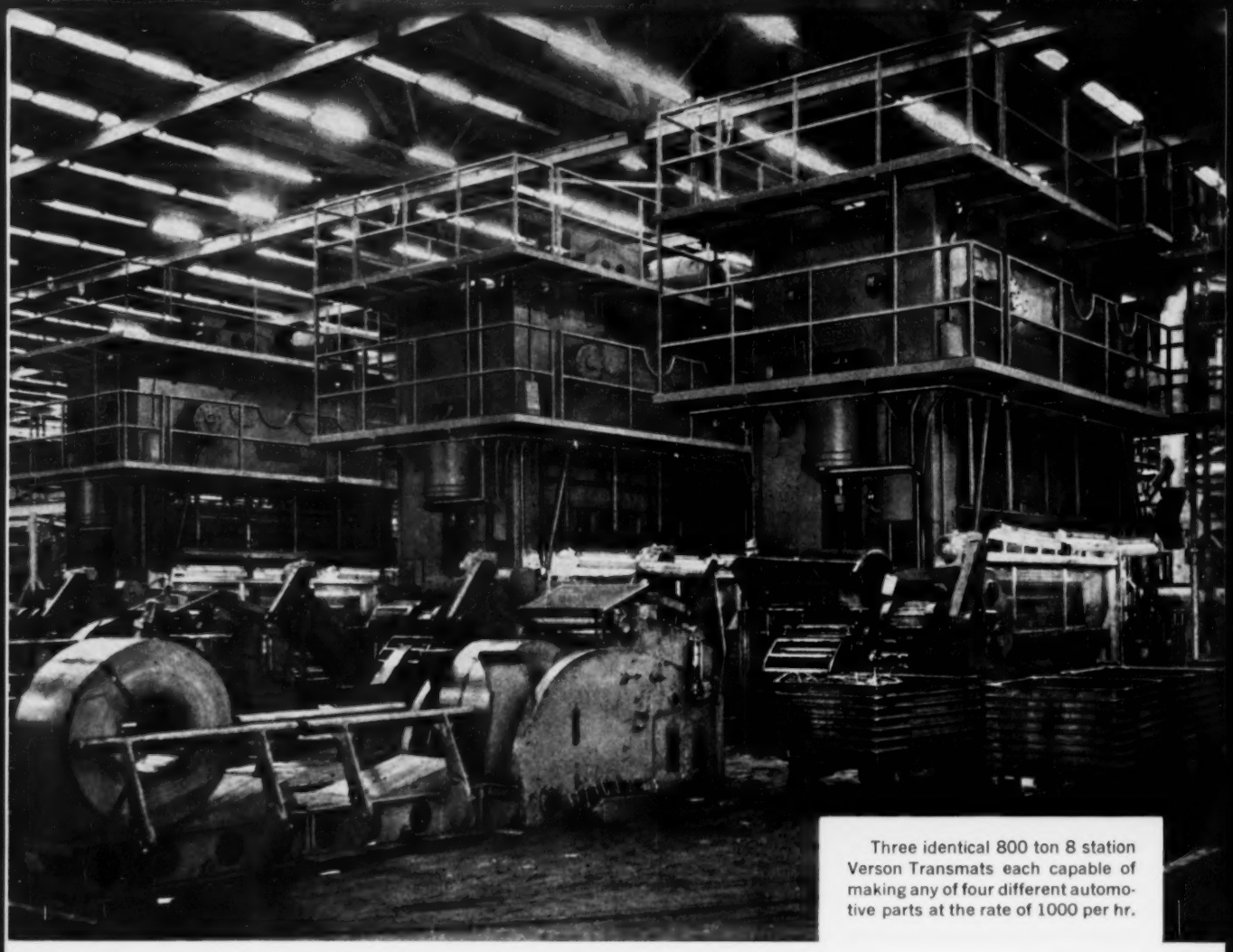

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